Telephony.

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A FORECAST.

As Independents we have proven both our courage and our tenacity. All we have to do is to keep a level head, and we shall find we are entering upon a wonderful era of progress and prosperity in the telephone business.—Manford Savage, president National Independent Telephone Association, in address delivered at Indiana convention.

The World's Telephone Statistics.

The American Telephone & Telegraph Co., through the office of its statistician, has just issued a booklet of absorbing interest. It presents an analysis of telephone and telegraph figures of the entire world, graphically illustrating the figures and deductions by diagrams. Comparisons are drawn between the development of different nations and even of cities, in which, needless to state, the United States and its centers of population come off exceedingly well.

The booklet is reprinted on the following pages in its entirety. It deals with the telephone question in a fair and impartial manner. It is well worth careful study and preservation by every telephone and telegraph man.

Is A Public Service Commission a Necessity?

In a thoughtful article, contributed by Theo. Van R. Ashcroft to a recent issue of The Quarterly Voter (Chicago), the advisability or desirability of placing public utility corporations under the supervision of a state public service commission is discussed in an enlightening manner.

"The experience of Chicago, during the last year," says the writer, "in its attempts to prescribe utility rates points conclusively to a wiser method of regulation than directly by the city council."

The membership of that body, he declares, is constantly changing and the character of its conclusions must also be subject to as constant change. To further indicate the folly of entrusting so important a matter as the regulation of a public utility to such a group of men, he points out that, in the Chicago council, which is composed of seventy members, there are to be found nine saloonkeepers, four insurance brokers, nine real estate men, nine lawyers, one plumber, seventeen unemployed, two Board of Trade men, one physician, one clothing merchant, one publisher, one undertaker, two printers, one race horse owner, two commission merchants, two coal dealers, one contractor, one florist, and six manufacturers.

"The regulation of utilities in any state," he continues, cannot be accomplished by any one man or by any group of a few men applying themselves, however industriously, for a period of a few months. The problem is too great.

"It is a technical problem and the regulation of utilities by municipalities, no matter how honest their efforts may be, is spasmodic and can never accomplish a lasting benefit. Conditions show the necessity of a form of regulation which will not only be firm, but just, with respect to all parties in interest, and which more particularly will be consistently enforced.

"There should be eliminated from such regulation every influence savoring of politics. In theory there is no politics in the regulation of corporations, but the history of our municipalities shows that a suspicion of its actual presence is not without foundation."

"Municipal attempts at rate regulation," says Mr. Ashcroft, "too often are the result of popular party promises of extremely low rates, which promises are founded in political expediency rather than in any real hope of their possibility. City councils are essentially political bodies, seeking to make their acts popular with the public rather than to base their conclusion upon the established law and facts, and thus compel the courts after expensive de-

lays ultimately to determine a rate which they, through political fears, avoided.

"Cases may be found where municipal regulation has been equitable, but such instances are rare and are possibilities rather than probabilities."

"The weakness of municipal regulation of corporations is inherent in our form of municipal government," the author continues. "Successful regulation calls for the analysis of complicated technical data and the exercise of a judgment trained to comprehend the practical problems of utility management.

"Regulation of utilities is predicted upon a mutual obligation—an obligation of the corporation toward the people, and an obligation on the part of the people toward the corporation. The obligation of the corporation is threefold.

"First, it should furnish a service which is adequate and efficient.

"Second, the common law requires that such service can be furnished at no more than a reasonable rate.

"Third, the corporation owes to the public an obligation not to impose upon it or violate the spirit of fairness in the issue of its securities."

After discussing in detail the various problems which naturally arise in connection with the regulation of public service corporations, Mr. Ashcroft concludes:

"There is no solution of this subject without there being enacted in every state a comprehensive code of legislation dealing with the subject of the taxation of values, the allowing of values for rate purposes, uniform accounting legislation and publicity of accounts, and giving to some established body the authority of enforcing its rules and regulations. The remedy for this condition lies in the adoption of a public service commission law."

"Such a commission," he asserts, "has authority, when proper, to determine the fair, present value of properties; it has the authority to audit all accounts; to compel efficient and excellent service, adequate in every respect; to protect the public against the dangers of stock jobbing, if that practice should ever again be resurrected; and it has the power and the authority to guarantee to the investor the undisturbed benefit from his investment in a franchise industry and a reasonable rate of return.

"Such a commission should be made up of men who are experts in their service, who would enjoy long tenure of office, and who would be removed from the seat of disturbance, not interested in any way by the result of their work, removed from political temptation and clothed with the judicial temper of fairness, so that they will not be influenced by the probable effect of a decision in its temporary effect upon the public mind."

The Telephone and Power Systems.

During the past month, the National Electric Light Association held its annual convention at Seattle. This naturally directed the attention of all engaged in the electrical business to the Pacific Coast. The convention issue of the electrical papers contained articles descriptive of many different power and electric light companies in that territory. In these descriptions, there were generally a few words paying tribute to the telephone as one of the means of facilitating the operation of the systems, some of which furnish service to a territory covering many square miles.

Many of the companies have several power plants located at distances of a few miles to over a hundred miles from consumers to whom current distribution is made through substations. The operation of the systems is controlled by a load dispatcher who gives all orders for cutting in and out lines, or apparatus or shifting loads. All these orders are given by telephone and if the telephone were not available, it would be extremely difficult to operate the power systems.

Many of the companies have their generating stations and substations connected with the load dispatchers offices by two telephone lines. One line usually follows the high tension transmission line, sometimes being on the same poles with the power wires and sometimes on separate poles. The other line is usually leased from the commercial telephone company and follows the regular toll leads. Two different routes are therefore provided so that it is seldom that communication is interrupted to any extent.

The telephone lines, which are run on the high tension poles, are usually placed about seven feet or more below the power wires and transpositions made at regular intervals. The telephone sets are connected to the lines through special insulating transformers which will stand a very high voltage between windings before breaking down.

These private lines are largely used by the linemen and patrolmen. Iron box, weatherproof telephone sets are placed at frequent intervals along the line so that the patrolman is always within communicating distance of headquarters.

The transmission obtained on these lines is remarkably good although at times they are noisy. At such times some of the companies use the telegraph.

An idea of the importance of the telephone to power systems may be gained from the statement that about 2,000 miles of moderate and extra high voltage lines of the Pacific Gas & Electric Co., of California are operated by telephone.

Courtesy Over the Wire.

Because of the importance and extensive use of the telephone in the business and social world, particular care in the tone of voice used in talking over the wires should be exercised by every one. When using the telephone, the tone of the voice may either secure or lose a customer. The voice, be it petulant or pleasant, is modified or enhanced by the expression of the face. Customers may overlook an irritable tone when they can see the person who is talking, but if the same tone comes over the telephone it is very likely to cause dissatisfaction and the loss of a customer.

It is in talking over the telephone, either on business or social affairs, that courtesy can be displayed to advantage and profit.

There is no possible way in which an employe may make money and friends for his employers so easily and with so little effort

A Compilation of Telephone Statistics of the World

Pamphlet Just Issued by Statistican's Office of A. T. & T. Co. Presents Close Analysis of Telephones and Telegraphs—Shows Growth During Past Ten Years, Relative Development in Various Countries, Investments, Earnings, Etc., Etc.

1. CONDITION JANUARY 1, 1912, AND PROGRESS DURING 1911

There were approximately 12,453,000 telephones and 29,566,000 miles of telephone wire in use in the world January 1, 1912. Compared with January 1, 1911, this is an increase of 10 per cent. in telephones and 9 per cent. in wire. A careful estimate places the world's telephone investment January 1, 1912, at about $1,729,000,000, which is very nearly the value of all gold coin and bullion in the United States. The annual number of telephone conversations may be placed at 22,000,000,000, which is about five times the annual number of passengers carried by all the railroads of the world.

For the purpose of this compilation the world's telephone statistics are generally tabulated in four territorial divisions, shown in table No. 1, and graphically shown in Fig. 1.

The geographical distribution of telephones and wire is shown in table No. 2.

The year 1911 is the thirty-fifth since the invention of the telephone by Prof. Alexander Graham Bell. A survey of the progress of telephone service during the past year, and of the many notable events in connection with this progress, justifies the statement that all civilized nations have awakened to the value of the telephone in commercial and social life.

	Telephones Jan. 1, 1912			Wire Jan. 1, 1912		
	Number (partly estimated)	Increase over Jan. 1, 1911	Per cent to Total	Miles (partly estimated)	Increase over Jan. 1, 1911	Per cent to Total
United States	8,362,000	10%	67.1%	18,179,000	9%	61.5%
Canada	335,000	18%	2.7%	788,000	11%	2.6%
Europe	3,239,000	9%	26.0%	9,461,000	8%	32.0%
All other countries	517,000	21%	4.2%	1,138,000	32%	3.9%
Total	12,453,000	10%	100.0%	29,566,000	9%	100.0%

Table 1.—Distribution of Telephone and Wire By Divisions.

Of the various economic and social forces that underlie the recent telephone progress outside of the United States, one of the most important, and one of far reaching consequence, is the gradual abolition of rate systems that have proved inadequate to the rapid popularization of the telephone, and the adoption of systems approximating the system in the United States. The telephone service of most European countries has suffered from the retention of rate systems not suitable to the needs of the public. Now, however, the difficult problem of adapting charges justly proportionate to service rendered, thus equalizing the charges among various classes of consumers, claims the attention of the telephone administrations of important European states.

Austria is just emerging from a thorough revision of the old rate system adopted at the opening of the service, the revised schedule having gone into effect January 1, 1911. In Belgium, ever since 1908, considerable agitation has prevailed for more equitable rates. After a careful study of the problem, the minister in charge of the postal and telegraph administrations submitted (September, 1911), a new telephone rate law for the approval of the king, upon the adoption of which an era of rapid development is predicted. The German telegraph administration, on the other hand, has not yet succeeded in obtaining the approval of the Diet for the proposed change of telephone rates. Indeed, the law as originally drafted has had a rather checkered career. In 1906, in accordance with a resolution of the Reichstag calling for a reform, the government elaborated a new schedule. This was submitted to a committee of officials and representative business men, January, 1908. In a revised form it reached the Diet, which immediately referred it to a budget committee. In November, 1909, the bill was again submitted, and was again referred to a budget committee, which (December, 1910), adopted a compromise embodying further changes. Early in 1911 the bill, as modified, came back to the Diet for a second reading, with the same result—a return to the budget committee. The latter prepared a second compromise, but adjourned without further action. What the final outcome will be is a matter of conjecture.

	Number of Telephones (Partly Estimated)			Miles of Wire (Partly Estimated)		
	Jan. 1, 1912	Jan. 1, 1911	Increase	Jan. 1, 1912	Jan. 1, 1911	Increase
North America	8,729,000	7,907,000	822,000	19,037,000	17,401,000	1,636,000
South America	120,000	86,000	34,000	233,000	137,000	96,000
Europe	3,239,000	2,966,000	273,000	9,461,000	8,762,000	699,000
Asia	166,000	149,000	17,000	358,000	288,000	70,000
Africa	41,000	34,000	7,000	144,000	128,000	16,000
Australasia	124,000	110,000	14,000	265,000	212,000	53,000
Oceanica	17,000	8,000	9,000	43,000	15,000	28,000
West Indies	17,000	12,000	5,000	25,000	19,000	6,000
Total	12,453,000	11,272,000	1,181,000	29,566,000	26,962,000	2,604,000

Table 2.—Geographical Distribution of Instruments and Wire.

The Swiss Republic, in consequence of the rate schedule adopted in 1896, faces the problem of equilibrating telephone revenue and expenses. As early as 1903 the federal council submitted a report calling for an increase in rates, but political and other considerations prevented the adoption of this recommendation. In 1910 the federal council again issued a message on the question of increasing telephone rates. By instruction of the Swiss parliament, however, the council was requested to obtain more complete data on average costs and to recast the entire telephone accounts according to commercial accounting principles. The result of such an investigation was embodied in a special report, issued March, 1911, which showed that as figured by the committee, the financial

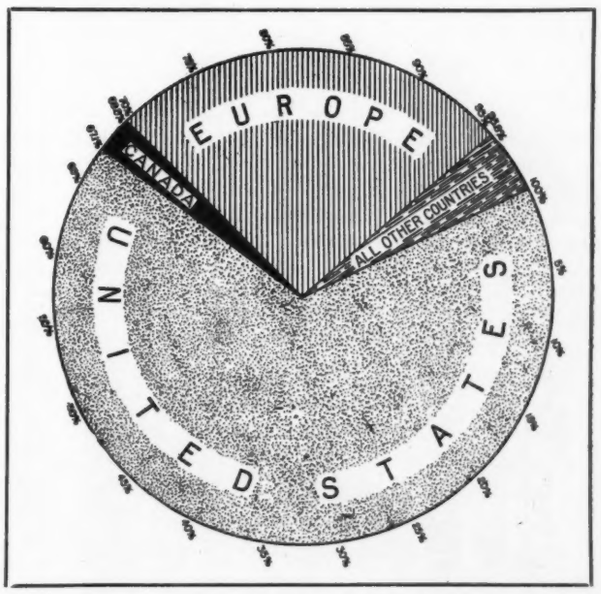


Fig. 1.—Chart Showing Division Distribution.

result of twenty-nine years of telephone operation is a deficit of several million francs. With that report was coupled the recommendation that the annual telephone revenue be increased by at least one million francs by increasing both exchange and toll rates.

In consequence of the amalgamation of the four British

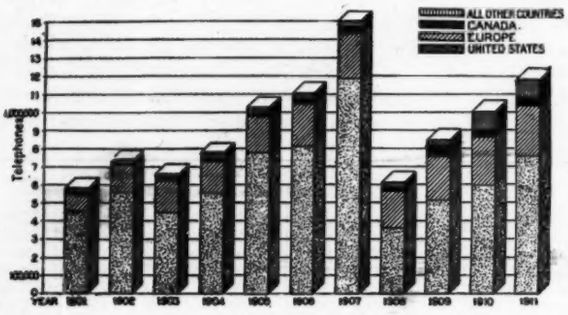


Fig. 2.—Annual Increases in Telephones, By Countries.

colonies that constitute the Union of South Africa, the central telephone administration is preparing a new telephone rate schedule. Italy, France, Russia, Japan and the Commonwealth of Australia contemplate a thorough reorganization of their telephone service, while Imperial China took the first steps toward the general introduction of the telephone.

The Italian government, by special legislation, has provided $600,000 for the rapid extension of its telephone service. Moreover, the recent report of the government by the royal telephone commission, strongly recommends an additional expenditure of $30,000,000 between 1911 and 1928. France, by a decree of July, 1911, has sanctioned the expenditure of $2,250,000 for the construction and extension of the Paris exchange. Great Britain, in the telephone transfer bill recently passed, has voted $20,000,000 for the development of its telephone service after the transfer. Again, the German government has authorized an eleventh special appropriation, amounting to $5,280,000, for the extension of its telephone service during 1912. Finally, the budget of the Commonwealth of Australia provides $3,000,000 for its telephone and telegraph services, besides creating a special fund of $3,000,000 to be drawn on during the next two years.

The prospect for telephone growth in South and Central America has considerably improved. On January 1, 1912, these two continents, with a population of about 54,000,000—or lacking 10,000,000 that of the German Empire—showed a telephone development of about one telephone to every 500 persons as compared with one telephone to every 62 persons in the German Empire. The best developed state in South

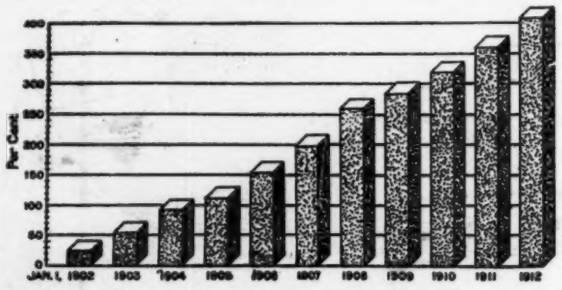


Fig. 3.—Percentage Increases in World's Telephones.

America is Argentine, with a total of about 68,000 telephones; that of Central America is Panama, with a total of about 1,800 telephones. On account of the greatly improved commercial activities both of South and Central America, there is good reason to think that the telephone service is destined to achieve considerable proportions in the near future.

During 1911 the Imperial Government of China formulated a definite program for extending the telephone service, and included in that program provisions for the gradual establishment of manufacturing plants of electrical apparatus. The Japanese government is still hard pressed to furnish telephone service to waiting applicants. According to latest reports there are over 45,000 persons on the waiting list, and that number increases by about 3,000 per month. So far the administration has been able to connect only 25,000 subscribers per year. The administration had worked out a second program of telephone expansion and appropriated $12,000,000 for the five years ending March 31, 1913. This plan has been found to be totally inadequate to the needs, and thus a third program, providing $25,000,000 for the five years after 1913, is under consideration.

Noticeable progress has also been made in the various states constituting Australia and New Zealand. These two dominions have about 124,000 telephones, or 2.3 per 100 population. It is worth while to recall in this connection that the combined area of Australia and New Zealand is about equal to the area of the United States. The recently created Union of South Africa likewise shows progress as regards the telephone service. January 1, 1912, there were about 17,000 stations in the Union, or 0.3 per 100 population. Omitting the native population, which is nearly 80 per cent. of the total, however, the Union has a telephone development of 1.3 per 100 population. The above facts indicate that telephone service outside the United States is destined to progress for some years at a more rapid pace than heretofore.

During the past year the long distance telephone service of

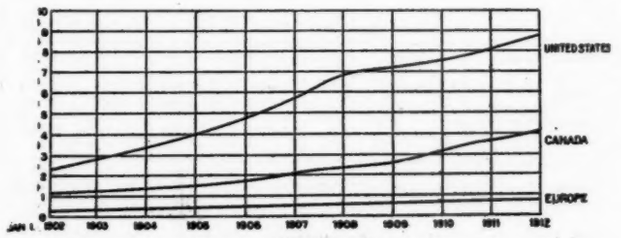


Fig. 4.—Telephones Per 100 of Population.

the world has received notable extensions. In the United States commercial service was opened between New York and Denver, 2,160 miles, this being now the longest distance over which oral communication is given commercially. In Europe long distance service has been greatly extended by utilizing both the new loaded cable between Great Britain and Belgium —by which telephone service is expected to be given between London and Berlin—and the new telephone cable, constructed also on the Pupin principle, between Dover and Calais. The latter enables conversation to be carried on between Glasgow, Edinburgh and Paris, and also between Aberdeen and the French capital, a distance of 910 miles. Successful trials have also been made between London and Geneva, a distance of 560 miles, and from London to Basel, a distance of 600 miles.

Recent progress in the art of submarine telephone cable manufacture will have far reaching consequences. At the present time there are over 400 miles of submarine telephone cable in use in the world, and of this total about one-half is represented by four cables between France and England, and the two between Belgium and England. The longest submarine telephone cable lies between La Panne (Belgium) and St. Margaret's Bay (England), a distance of 55 miles.

The European international long distance land line systems have likewise received important additions, due to the opening of the line between Paris and Madrid, 900 miles, and the direct line between Berlin and Rome still under construction, a distance of over 1,000 miles. As regards the continent, there is now scarcely any important city that cannot talk with any other important city. By far the largest interurban or toll telephone

plant in Europe has been built by the German government, which, according to the latest official statistics, had about one-half of the total interurban or toll telephone wire of Europe.

Finally, it is worthy of note that during the year 1911 the great United States railway systems have made rapid advances toward the general use of the telephone for train despatching. Since the introduction of the use of the telephone for that purpose, over 200 of the United States railroads have adopted that system. In fact, the telephone has supplemented the telegraph on over 50,000 miles of railroad, which is over 20 per cent. of the total railroad mileage of the country. A careful estimate places the miles of wire used by railroad companies for train despatching at 120,000, and the corresponding number of telephones at 10,000.

2. Growth During Past Ten Years.

The two charts, Figs. 2 and 3, show the annual increases in telephones of the world from 1901 to 1911 inclusive. Fig. 2 represents the actual increases and shows that during 1911 the increase was more than twice that during 1901. It also appears that during 1910 the annual increase in telephones of the world again reached the million mark. Fig. 3 represents, at the beginning of each year, the percentage increase over January 1, 1901. While the telephone business has been increasing constantly, two decided periods of retarded telephone progress are noticeable, especially so for the United States. The first com-

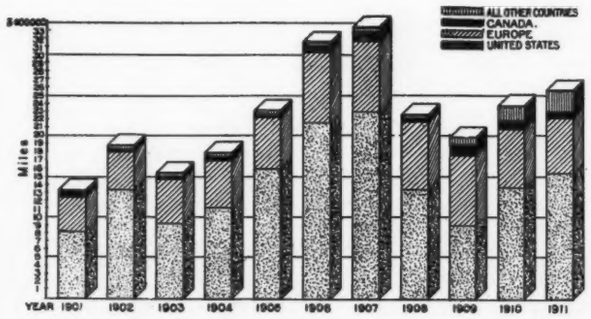


Fig. 5.—Annual Increases of Telephone Wire Mileage.

mences with the year 1903, and the second—and by far the greater—with the year 1908. This retardation of telephone progress, particularly in the United States, was caused by the general depressed financial condition of the country, which is evidenced by the following facts:

Comparing the years 1907 and 1908, the gross earnings of ten of the leading United States railroads decreased $88,500,000; the building and real estate returns $95,000,000; and the total bank clearings, which in 1906 were $160,000,000,000, had declined to $132,000,000,000 in 1908. Furthermore, liabilities of failures, which in 1906 were $123,000,000, more than doubled during 1907, and were $259,000,000 in 1908.

Considering telephones per 100 population and referring only to the United States, Canada and Europe, Fig. 4 shows their respective condition during the past ten years. At the beginning and end of the period the exact figures are:

	U. S.	Canada.	Europe.
January 1, 1902.....	2.3	1.2	0.3
January 1, 1912.....	8.8	4.2	0.7

From this it appears that it takes Europe about two years to advance 0.1. Assuming that European telephone progress continues at this rate, to reach the present development of the United States (8.8), Europe must gain 8.1, which at the rate of 0.1 every two years would require 162 years. As such a forecast makes no allowance for the impetus in future progress due to the use of rates better adapted to the needs of the public and important advances in the art, the above period will be shortened materially. One thing, however, is certain: Europe offers yet a vast field for telephone progress, because at the beginning of 1912 it has reached only the development of the United States January 1, 1898.

Figs. 5 and 6, relating to the increase in the telephone wire mileage of the world, permit a comparison between the latter and the increase in stations, covering likewise a period of eleven years. January 1, 1901, the total telephone wire

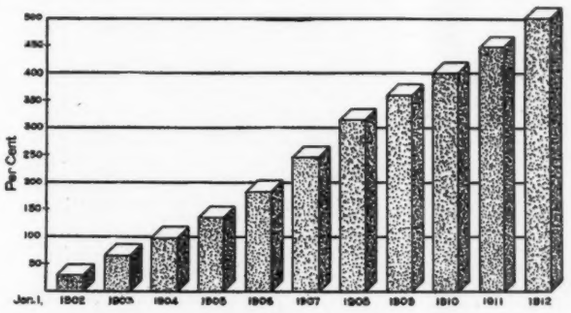


Fig. 6.—Percentage Increases of Telephone Wire Mileage.

mileage of the world was about five million miles; at the end of the period (January 1, 1912), it amounted to over twenty-nine million miles, an increase of 500 per cent. On the other hand, the increase in telephone stations during the same period was about 400 per cent.

Referring to Fig. 5, representing the actual annual increases in wire mileage, we find that the increase during 1911 was twice that of 1901. The lowest annual increase occurs during the year 1901.

It is worthy of note that the United States, January 1, 1912, had over one-half the total telephone wire of the world, and nearly twice the total mileage of Europe, while the latter at the same date had almost the same telephone wire mileage as the United States had at January 1, 1907. The pronounced increase in the wire mileage of "all other countries" is largely due to more accurate information.

Fig. 7 depicts the total estimated telephone investment of the world, subdivided according to territorial divisions at January 1 of each year from 1902 to 1912 inclusive. During this period the world's investment almost quadrupled, increasing from $482,000,000 to $1,729,000,000. Over one-half of this enormous increase was in the United States, where the annual increase averaged approximately $66,000,000. This was about $27,000,000 more than the corresponding average increase in

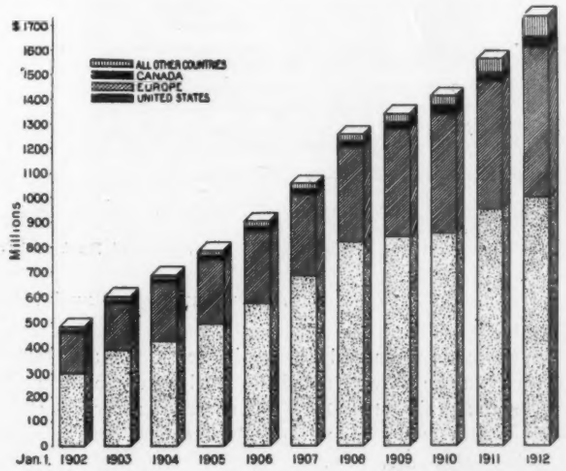


Fig. 7.—Distribution of World's Telephone Investment.

Europe. At the commencement of the year 1912 the total estimated investment in the United States ($1,025,000,000) was about twice that in all Europe ($593,000,000) and was over one-half the investment of the whole world. At the same date Canada is estimated to have $44,000,000 invested in telephones and "all other countries" $67,000,000.

Fig. 8 depicts the telephone conversations of the world for the years 1901 to 1911 inclusive, for the United States, Europe, and all other countries, and shows the proportion of each to total.

The use which the world made of the telephone in 1911 is

Division	No. of Conversations during 1911 (estimated)	Increase over 1910	Per cent of Total
United States	14,500,000,000	7%	66.0
Canada	900,000,000	18%	4.0
Europe	5,800,000,000	8%	26.4
All other countries	800,000,000	20%	3.6
Total	22,000,000,000	8%	100.0

Table 3.—Distribution of Telephone Conversations.

illustrated in table No. 3 showing the distribution of conversations for the four divisions.

The combined number of telephone conversations of the rest of the world is but one-half that of the United States. The telegraph traffic of the United States presents quite a contrast. Placing the world's telegraph traffic during 1910 at about 579,000,000, the United States took but 17 per cent. of the total, while Europe had 62 per cent. In other words, Europe has about the same proportion of the world's telegraph traffic as the United States has of the world's telephone traffic.

Going back to the first authentic publication of telephone traffic in the United States (1883) the total number of telephone conversations was estimated to be 217,000,000. During the intervening twenty-eight years the United States traffic has reached, as shown, the colossal total of over fourteen billion,

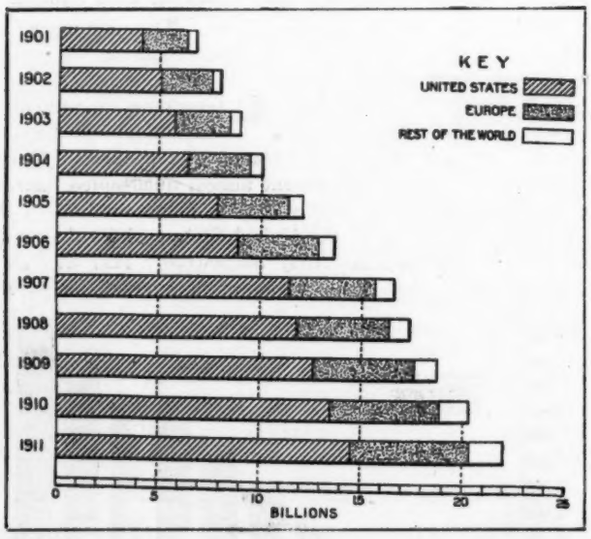


Fig. 8.—Conversations, Showing U. S., Europe and Rest of World.

an increase of 6,500 per cent., or an average annual increase of 232 per cent.

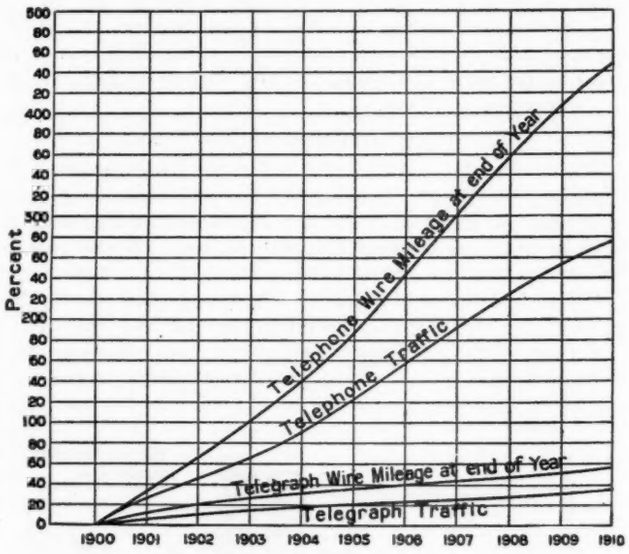
The annual increases, both in the telephone and telegraph traffic and in the wire plant of the world are shown in Fig. 9, covering the period 1900-1910. The curves represent the percentage increases over the traffic during 1900 and mileages at the end of the year, 1900.

Referring first to the traffic curves, the telephone has gained 277 per cent. and the telegraph 36 per cent. In other words the percentage increase in telephone traffic is about eight times that in telegraph traffic. During the same period the increase in wire plant was 448 per cent. for the telephone as compared with 57 per cent. for the telegraph, so that the percentage increase in telephone wire is also approximately eight times that of telegraph wire.

3. Relative Development in Various Countries, Jan. 1, 1911.

A. TELEPHONES IN USE.

The statistical table, No. 4, and the diagram, Fig. 10, show the telephone development of the world January 1, 1911. At that date the United States had 67.4 per cent. of the total telephones, Europe had 26.3 per cent., Canada 2.5 per cent., thus leaving but 3.8 per cent. for all other countries. The high percentage increase during 1910 for Bosnia, Greece and



Note: Growth expressed as a percentage increase over the 1900 figures.

Fig. 9.—Growth of Traffic and Wire Mileage Compared.

Servia, is due to the fact that these countries are just beginning to be developed.

The table shows, that, as in former years, the German Em-

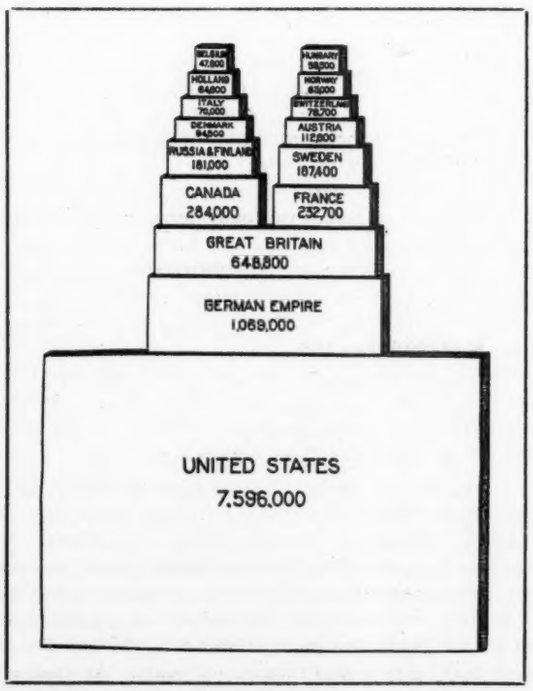


Fig. 10.—Comparing Telephone Stations, U. S. With Europe.

pire and Great Britain remain the leaders in European telephone development, the German Empire having about 36 per cent. and Great Britain 22 per cent. of all European telephones.

Of the remaining countries, only one, France, exceeds 200,000 telephones, and only three others—Austria, Russia and Sweden—have over 100,000 telephones each. The combined number of telephones in six important European States—Belgium, Norway, Denmark, Hungary, Italy, and the Netherlands—is still less than the number of telephones in New York City, while Chicago has more telephones than France, and Boston more than Austria; the three Scandinavian kingdoms combined do not equal the total number of telephones in New York City by about 57,000.

Fig. 11 presents graphically the statistics shown in table No. 4 in the column "Telephones per 100 Population." Despite considerable activity in some European countries, the relative positions have not changed during the past year. Denmark still leads Sweden by a small margin. As the average for Europe January 1, 1911, was 0.7 telephones per 100 population, the development of the United States at the same date—8.1 per 100 population—was almost twelve times that of Europe. South America advanced to 0.2 telephones per 100, and Canada to 3.7, or more than five times the development of Europe.

Looking at the telephone development from the point of population per station, it appears that the United States January 1, 1911, averaged one station to each 12 inhabitants, as

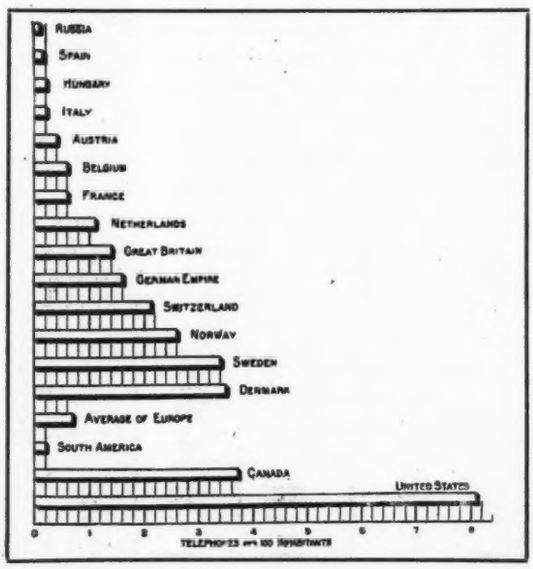


Fig. 11.—Telephones Per 100 Population, Jan. 1, 1911.

against the European average of one to 148. Of the European States, Denmark and Sweden are about equal, the former having one station to every 28, and the latter one station to every 29 inhabitants. The German Empire and Great Britain have about twice, France six times and Austria eight times the population per station of Sweden.

A more comprehensive view of the relation between telephone development and population is gained from Fig. 12. This chart compares European countries, the United States and Canada, representing in each case both population per square mile and telephones per 100 population. The greatest population per square mile is found in Belgium, which has 663 inhabitants to the square mile, and the largest number of telephones per 100 population is found in the United States, which January 1, 1911, had 8.1 telephones per 100 population.

It is evident from the chart that Canada has by far the lowest density of population; next comes South America and then Norway, while Sweden is about equal to the United States, and Italy to Germany. In telephone development Canada ranks next to the United States. Denmark and Sweden, which have about the same development, are still considerably below one-half the telephone development of the United States.

Passing from the general survey of telephone development of the various countries of the world, it is interesting to note

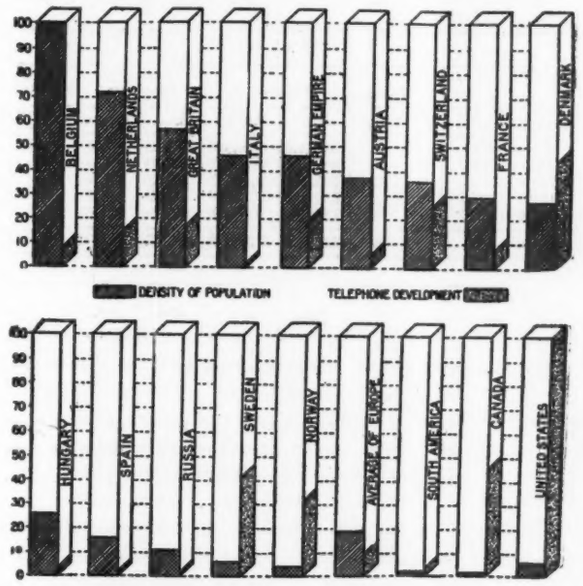


Fig. 12.—Density of Population and Development, Jan. 1, 1911.

Note: Density of Population in Belgium and Development in U. S., taken as 100 per cent.

the development of the large cities of Europe and the United States as shown in Fig. 13. For further analysis the cities are divided into five groups, i. e.:

Group I—Cities with population above 800,000.
Group II—Cities with population from 350,000 to 800,000.
Group III—Cities with population from 200,000 to 350,000.
Group IV—Cities with population from 125,000 to 200,000.
Group V—Cities with population from 100,000 to 125,000.

Table No. 5 discloses the following striking facts: First, the United States has about one-fifth the population of Europe;

Division	Telephones January 1, 1911.	Increase during 1910		Per cent of Total	Telephones per 100 Population	Population per Sq. Mile
		Number	%			
United States	7,595,938	600,246	8.6	67.4	8.1	30
Canada	284,373	45,184	18.8	2.5	3.7	4.7
Europe:—						
Austria	112,604	16,764	17.5	1.0	0.4	246
Belgium	47,648	4,907	11.5	0.4	0.6	663
Bosnia	747	151	25.3	..	0.04	96
Bulgaria	2,303	253	12.3	..	0.05	116
Denmark	94,531	7,095	8.1	0.9	3.5	182
Finland	30,478	..	..	0.3	1.0	21
France	232,743	21,079	9.9	2.0	0.6	190
German Empire	1,068,849	100,748	10.4	9.5	1.6	310
Great Britain	648,832	45,235	7.5	5.8	1.4	371
Greece	1,792	290	19.3	..	0.06	107
Hungary	58,506	7,481	14.6	0.5	0.2	167
Italy	70,139	7,873	12.6	0.6	0.2	312
Luxembourg	3,334	220	7.0	..	1.3	257
Netherlands	64,620	6,207	10.6	0.6	1.1	464
Norway	63,000	5,647	9.8	0.6	2.6	19
Portugal	6,765	451	7.1	..	0.1	155
Roumania	15,000	812	5.7	0.1	0.2	137
Russia	150,850	20,377	15.6	1.3	0.1	67
Servia	2,635	1,075	68.9	..	0.1	155
Spain	25,000	196	0.8	0.2	0.13	99
Sweden	187,441	13,386	7.7	1.6	3.4	32
Switzerland	78,736	4,978	6.7	0.7	2.1	236
Total	2,966,553	265,225	9.8	26.3	0.7	119
South America	85,744	13,642	18.9	0.8	0.2	6.5
All other countries	339,285	92,671	37.6	3.0	0.03	28
Total World	11,271,893	1,016,968	9.9	100.0	0.6	30

Table 4.—Telephone Development of the World, Jan. 1, 1911.

second, Europe has 2½ times as many cities above 100,000 population as the United States; Third, in Europe 14 per cent. of the total population and 55 per cent. of the total telephones are found in 159 cities; fourth, in the United States 26 per

cent. of the total population and 33 per cent. of the total telephones are found in 64 cities.

The most salient feature of the table is, however, the disparity in the figures showing average city developments: 2.6 for Europe, and 10.3 for the United States. Moreover, although

January 1, 1911.								
	No. of Cities		Population		Number of Telephones		Telephones Per 100 Pop	
Groups of Cities	U.S.	Europe	U.S.	Europe	U.S.	Europe	U.S.	Europe
I. Over 800,000	4	14	10,009,000	25,292,000	907,823	721,381	9.0	2.8
II. 350,000-800,000	12	31	6,190,000	15,390,000	634,614	358,365	10.2	2.3
III. 200,000-350,000	14	43	3,656,000	11,212,000	488,716	341,543	13.3	3.0
IV. 125,000-200,000	16	46	2,401,000	7,224,000	251,332	157,630	10.5	2.2
V. 100,000-125,000	18	25	1,969,500	2,814,000	213,254	67,389	10.8	2.4
Total cities	64	159	24,225,500	61,932,000	2,495,739	1,646,308	10.3	2.6
Entire Country			93,104,000	437,861,000	7,595,938	2,966,553	8.1	0.7
Ratio of Cities to Entire Country			26%	14%	33%	55%		

Table 5.—Development in Large Cities of U. S. and Europe.

the 159 European cities have about 260 per cent. of the population of the 64 United States cities, yet they have but 66 per cent. of the telephones in the 64 United States cities.

Referring to Group III (200,000 to 350,000 population), we find the 43 European cities do not have one-fourth the tele-

Cities	Telephones Per 100 Population				
	Jan. 1 1895	Jan. 1 1900	Jan. 1 1905	Jan. 1 1910	Jan. 1 1911
Europe—					
Stockholm	4.1	9.7	13.6	18.5	19.9
Copenhagen	1.2	3.0	4.9	6.7	7.0
Christiania	3.0	5.4	5.4	6.7	6.9
Berlin	1.6	2.3	3.5	5.1	5.3
Hamburg-Altona	1.5	2.2	3.6	4.6	4.7
London	0.2	0.6	1.4	2.5	2.8
Paris	0.7	1.2	1.8	2.5	2.7
Vienna	0.5	0.8	1.2	2.1	2.3
St. Petersburg	0.2	0.3	0.6	1.9	2.2
United States—					
Los Angeles	2.0	5.7	14.1	23.1	24.0
Chicago	0.8	1.3	4.9	9.8	11.0
Boston	1.0	2.3	4.8	8.6	9.2
Philadelphia	0.3	0.9	4.6	7.9	8.6
New York	0.6	1.4	4.6	7.6	8.3

Table 6.—Comparison by Five Year Periods.

phones per 100 population of the 14 United States Cities. Again, referring to Groups IV and V, the 71 European cities had but 50 per cent. of the telephones of the 34 United States cities.

The chart (Fig. 13) also demonstrates that Europe has but

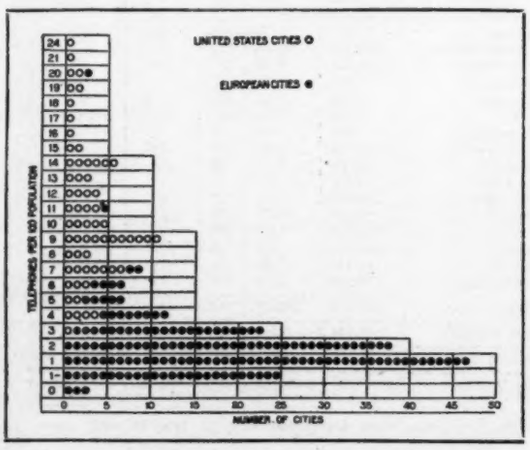


Fig. 13.—Graphic Display of Table 5.

one highly developed city (Stockholm) with 19.9 telephones per 100 population. Indeed, there are only thirteen cities with over 100,000 population in Europe with five or more telephones per 100 population. The great majority of European cities have only one to three telephones per 100 population, while 25

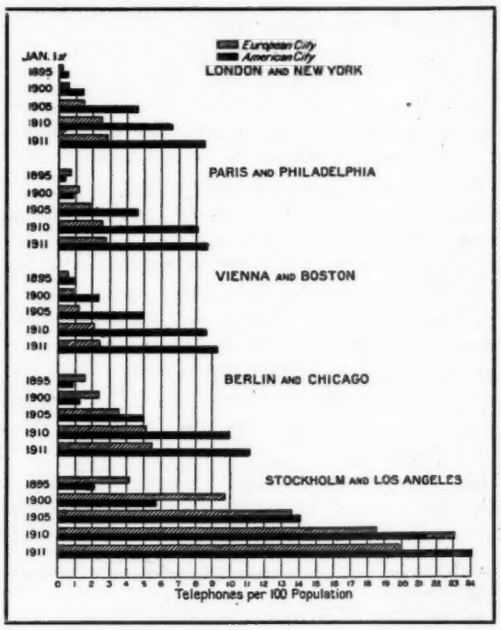


Fig. 14.—Development of Five Large Cities in U. S. and Europe.

cities have less than one. Furthermore, there are at present three large cities in Europe having no telephone development whatever, Constantinople, Adrianople and Saloniki.

Table No. 6 reviews the development of nine large European cities for sixteen years, and Fig. 14 compares five of these with five United States cities. Excepting Stockholm, none of the European cities has reached the development of New York,

Division	Miles of Wire Jan. 1, 1911	Increase during 1910		Per cent of Total Jan. 1, 1911
		Miles	%	
United States	16,633,590	1,383,141	9.0%	61.7
Canada	709,708	102,960	16.9	2.6
Europe:—				
Austria	287,523	31,179	12.1	1.0
Belgium	147,252	9,076	6.5	0.6
Bosnia	1,403	95	7.2	..
Bulgaria	5,762	523	10.0	..
Denmark	254,989	29,837	13.2	0.9
Finland	76,793	6,982	10.0	0.3
France	831,169	93,527	12.7	3.0
German Empire	3,553,504	329,027	10.2	13.2
Great Britain	2,116,368	91,420	4.5	7.9
Greece	5,323	1,064	24.0	..
Hungary	201,636	22,604	12.6	0.8
Italy	161,628	14,693	10.0	0.6
Luxembourg	3,612	62	1.7	..
Netherlands	141,478	19,082	15.6	0.5
Norway	129,168	8,383	6.9	0.5
Portugal	21,114	1,858	9.6	..
Roumania	45,333	4,175	10.0	..
Russia	260,049	18,630	7.7	1.0
Servia	8,045	678	9.2	..
Spain	54,027	4,806	9.8	..
Sweden	245,757	23,108	10.4	0.9
Switzerland	210,032	9,192	4.5	0.8
Total	8,761,965	719,999	8.9	32.5
South America	136,676	..	..	0.5
All other countries	720,168	..	..	2.7
Total World	26,962,107	2,384,653	9.7	100.0

Table 7.—World's Mileage of Telephone Wire.

while the highest development in the United States is 4.1 points above the corresponding highest development in Europe. Neither London, Paris, Vienna, nor St. Petersburg have reached a development of three telephones per 100 population. Berlin and Hamburg are 5.3 and 4.7 respectively, and Chris-

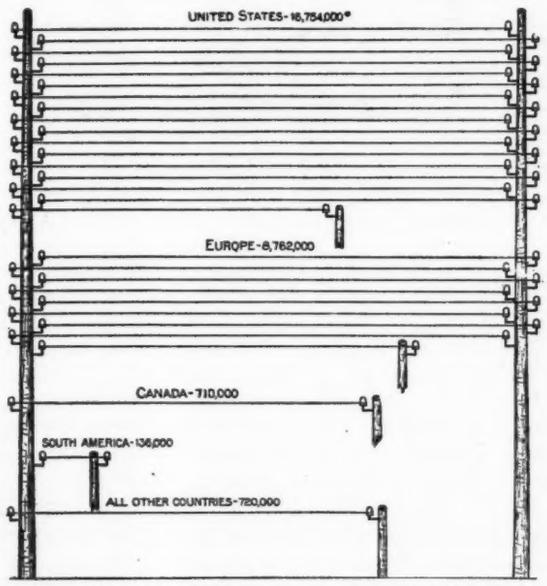
tiania and Copenhagen, with 6.9 and 7.0, respectively, are about equally developed.

In actual number of telephones, January 1, 1911, Berlin, London and Paris, with a combined total of 403,500 telephones, are about even with New York (402,000). The latter approximates very nearly the combined telephones of 14 European States.

B. Wire Mileage.

Table No. 7 and Fig. 15 view the telephone development of the world in point of wire plant January 1, 1911. At this date the grand total of telephone wire mileage was about 27,000,000, of which the United States possessed 61.7 per cent., Europe 32.5 per cent., Canada 2.6 per cent., South America 0.5 per cent., and all other countries 2.7 per cent. Thus the United States has almost twice the total telephone wire of all Europe. The German Empire, though possessing the largest number of telephones of any of the European states, has but one-fifth the telephone wire of the United States, and Great Britain but one-eighth.

The following table shows the estimated total length of tele-



*Includes 120,000 Miles R. R. Wire—Each Full Strand Above Represents 1,000,000 miles.

Fig. 15.—World's Telephone Wire Mileage, Jan. 1, 1911.

phone and telegraph wires January 1, 1911, including railroad telephone and telegraph wire. The statistics place the total length of telephone and telegraph wires in the world January 1, 1911, at 34,500,000 miles. Of this total, telephone wire took 78 per cent., telegraph wire (including cables) 17 per cent., and railroad telegraph wire 5 per cent. Again, the United States took 62 per cent. of the total telephone wire, and 34 per cent. of the total telegraph wire (excluding cables and railroad telegraph wire.)

Length of World's Telephone and Telegraph Wire.
(Partly Estimated.)
January 1, 1911.

	Miles	
Telephone Wire:		
United States	16,634,000	
Canada	709,000	
Europe	8,762,000	
All other countries	857,000	
	26,962,000	
U. S. railroad telephone wire	120,000	
Total telephone wire		27,082,000
Telegraph Wire:		
United States	1,849,000	
Canada	153,000	
Europe	2,352,000	
All other countries	1,090,000	
	5,444,000	
Submarine telegraph wire (in cables)	314,000	
Railroad telegraph wire	1,726,000	
Total telegraph wire		7,484,000
Grand total		34,566,000

C. Telephone Investment.

The statistics referring to investment do not always represent the actual replacement values of the various telephone plants, as such information is not recorded by the majority of foreign telephone administrations. The only data available in many cases are the aggregate amounts that have been put into the business since its inception. The world's telephone investment January 1, 1911, is estimated at $1,561,800,000, equivalent to $139 per telephone. This total investment is thus approximately equal to the value of the corn crop of the United States in 1911. Table No. 8 gives the estimated telephone investment of the world January 1, 1911.

Division	January 1, 1911	
	Investment	Per cent of Total
United States	$ 956,700,000	61.2%
Canada	36,700,000	2.4%
Europe	518,400,000	33.2%
All other countries	50,000,000	3.2%
Total	$1,561,800,000	100.0%

Table 8.—World's Estimated Telephone Investment, Jan. 1, 1911.

Division	Investment	Investment		Investment per Capita	
		% of Total	per Telephone	1910	1911
United States	$956,700,000	61.2%	$126	$9.38	$10.27
Canada	36,700,000	2.4%	129	4.33	4.76
Europe:—					
Austria	26,200,000	1.7	233	.80	.91
Belgium	13,195,000	0.9	277	1.57	1.75
Bosnia	245,000	.	328	0.07	0.13
Bulgaria	400,000	..	174	0.09	0.09
Denmark	11,713,000	0.8	124	4.00	4.34
Finland	2,246,000	0.2	74	0.69	0.72
France	50,000,000	3.2	215	1.27	1.27
German Empire	171,304,000	11.0	160	2.59	2.64
Great Britain	134,410,000	8.5	207	2.83	2.98
Greece	200,000	..	112	0.08	0.08
Hungary	12,400,000	0.8	212	0.48	0.59
Italy	9,600,000	0.6	137	0.28	0.28
Luxembourg	629,000	.	189	2.37	2.46
Netherlands	10,798,000	0.7	167	1.69	1.81
Norway	6,214,000	0.4	99	2.39	2.59
Portugal	1,174,000	0.1	174	0.20	0.22
Roumania	2,583,000	0.2	172	0.29	0.36
Russia	18,950,000	1.1	126	0.14	0.14
Servia	600,000	.	228	0.21	0.20
Spain	8,100,000	0.5	324	0.45	0.43
Sweden	20,619,000	1.3	110	3.50	3.73
Switzerland	16,797,000	1.1	213	4.20	4.46
Total	518,377,000	33.2%	$175	$1.14	$1.18
All other countries	50,000,000	3.2%	$118	..	..
Total world	$1,561,777,000	100.0%	$139	..	..

Table 9.—Detailed Investment Figures, Jan. 1, 1911—Estimated.

Figured on the respective number of telephones at the same date, the investment per telephone is:

United States	$126
Canada	129
Europe	175
All other countries	118
Total, world	$139

The investment representing "all other countries" includes $16,456,000 for the Commonwealth of Australia and New Zealand, $4,795,000 for the Union of South Africa, $15,223,000 for Japan, and about $6,668,000 for Brazil and Chili together.

During the year 1910, $145,500,000 was added to the telephone investment of the world, so that the total of $1,561,800,000 represents an increase of 10 per cent. over the corresponding investment January 1, 1910. In the United States alone, the estimated increase in investment during 1910 amounted to

World—Jan. 1, 1911.	Investment.	
Telephone	$1,561,777,000	60%
Telegraph	707,720,000	27%
Cable	350,000,000	13%
Total	$2,619,497,000	100%

Table 10.—Telephone, Telegraph and Cable Investment.

$97,600,000, or, excluding Europe, considerably more than the total cost of all telephone plants in service in the entire world.

In regard to the more detailed investment statistics given in table No. 9, perhaps the most striking feature is the high figure for investment per telephone in many of the important states. For instance, Austria, Belgium, France, Great Britain, Hungary, Spain and Switzerland all show an investment per telephone of over $200. The German Empire, Great Britain, and France combined have slightly more than two-thirds the entire telephone investment of Europe.

Excepting the German Empire and Great Britain, none of the European states exceeds $100,000,000, and the majority have invested less than $20,000,000 apiece. Of the Scandinavian kingdoms, Sweden has approximately twice the investment of Denmark, which in turn has about twice that of Norway.

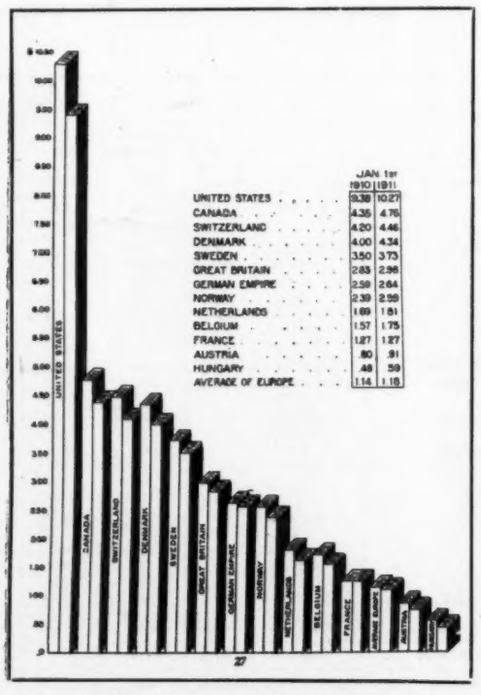


Fig. 16.—Telephone Investment Per Capita.

Viewing telephone investment from a per capita basis, a very different situation is revealed. A glance at Fig. 16 shows that, of the European countries, Switzerland leads and Denmark has advanced to second position; on the other hand, though the German Empire occupied first rank in point of total investment, it takes fifth place in point of investment per capita. The per capita investment of the United States ($10.27) is about nine times that of Europe ($1.18). Of the European countries shown on the chart, Hungary has the lowest per capita investment ($0.59), and Austria has not yet reached an investment of $1 per capita.

4. Investment—Telephone and Telegraph.

It is interesting to compare (table No. 10) the telephone investment of the world with that of the telegraph (including

Division	Gross Earnings	% to Total Earnings	Increase During 1909	Avg. Earnings per Telephone
United States	$221,471,000	67.4%	$20,881,000	$32.87
Canada	6,752,032	2.0	1,161,000	31.87
Europe—				
Austria	3,704,990	1.1	584,000	41.45
Belgium	2,066,740	0.6	152,000	50.75
Bosnia	11,555	..	1,900	21.90
Bulgaria	65,135	..	7,000	31.65
Denmark	2,040,158	0.6	233,000	24.45
Finland	448,518	..	..	15.95
France	8,161,600	2.4	1,098,000	40.20
German Empire	32,330,909	9.8	3,407,000	35.00
Great Britain	23.113,326	7.0	1,858,000	39.40
Greece	37,048	..	4,000	26.40
Hungary	1,859,205	0.6	155,000	38.85
Italy	2,416,902	0.8	348,000	42.70
Luxembourg	62,697	..	6,000	20.80
Netherlands	1,731,700	0.5	244,000	32.45
Norway	1,159,864	0.3	40,000	21.35
Portugal	240,516	.	10,000	40.90
Roumania	277,947	..	35,000	22.50
Russia	4,756,475	1.4	469,700	39.00
Servia	58,575	..	4,000	37.65
Spain	831,125	..	38,000	35.20
Sweden	3,959,765	1.2	309,000	23.60
Switzerland	1,996,439	0.6	169,000	27.95
Total	91,331,189	27.8	9,172,600	35.40
All other countries	9,163,500	2.8		30.00
Total world	$328,717,721	100.0%		

Table 11.—Telephone Gross Earnings for 1909, Partly Estimated.

submarine cables). In the absence of any definite information covering the entire world on that subject, only an estimate can be made. Using the total telegraph wire mileage, January 1, 1911, as a basis, the telegraph investment may be estimated at about $700,000,000. There are also 314,000 miles of submarine cable representing an estimated investment of $350,000,000 so that the total telegraph investment of the world January 1, 1911, may be placed at $1,050,000,000, as compared with a telephone investment of $1,561,777,000 at the same date.

5. Earnings for 1909—Telephone and Telegraph.

The figures for gross telephone earnings in European coun-

Country	Gross Telephone Earnings	Gross Telegraph Earnings	Total Earnings	Per cent of Total Gross Earnings	
				Telephone	Telegraph
Austria	$3,704,990	$3,162,571	$6,867,561	54%	46%
Belgium	2,066,740	1,191,450	3,258,190	63%	37%
Bosnia	11,555	281,324	292,879	4%	96%
Bulgaria	65,135	294,610	359,745	18%	82%
Denmark	2,040,158	488,697	2,528,855	81%	19%
France	8,161,600	8,101,828	16,263,428	50%	50%
German Empire	32,330,909	8,771,920	41,102,829	79%	21%
Great Britain	23,113,326	15,960,869	39,074,195	59%	41%
Greece	37,048	346,794	383,842	10%	90%
Hungary	1,859,205	1,491,079	3,350,284	55%	45%
Italy	2,416,902	3,820,513	6,237,415	39%	61%
Luxembourg	62,697	16,338	79,035	79%	21%
Netherlands	1,731,700	1,011,475	2,743,175	63%	37%
Norway	1,159,864	642,875	1,802,739	64%	36%
Portugal	240,516	849,862	1,090,378	22%	78%
Roumania	277,947	595,106	873,053	32%	68%
Russia and Finland	5,204,993	12,408,158	17,613,151	30%	70%
Servia	58,575	120,823	179,398	33%	67%
Spain	831,125	2,032,422	2,863,547	29%	71%
Sweden	3,959,765	615,049	4,574,814	86%	14%
Switzerland	1,996,439	812,661	2,809,100	71%	29%
Total Europe	$91,331,189	$63,016,424	$154,347,613	59%	41%

Table 12.—Comparison of European Gross Earnings.

tries are official, but those quoted for "all other countries" are mostly estimated. The total gross telephone earnings of the world for the year 1909 may be placed at $329,000,000, of which the United States earned $221,471,000 (67.4 per cent.), Canada $6,752,000 (2 per cent.), Europe $91,331,000 (27.8 per cent.),

and all other countries $9,163,500 (2.8 per cent.). Table No. 11 shows the gross telephone earnings of the various European countries, ranging from $241,000 (Portugal) to $32,331,000

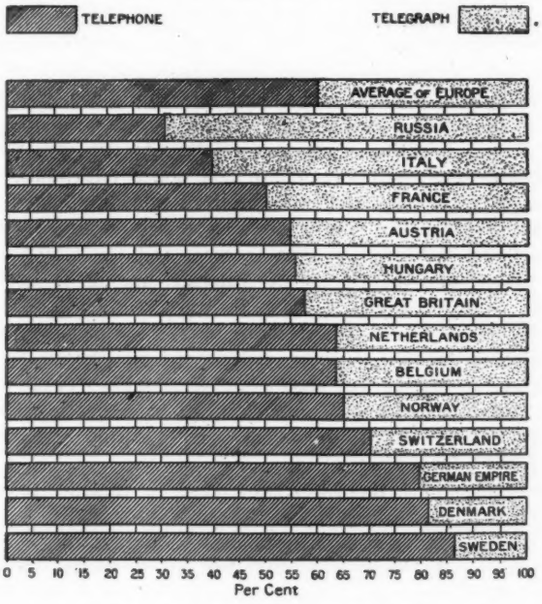


Fig. 17.—Illustrating Table 12.

(German Empire). The average earning per telephone for total Europe was $35.40.

On account of the almost universal custom of European

Type of Message	EUROPE		UNITED STATES	
	Number during 1909	% of Total Europe	Number during 1909	% of Total U. S.
First Class Mail Matter	15,387,000,000	74.4%	8,793,000,000	40.9%
Telegrams	345,000,000	1.7%	98,000,000	0.4%
Telephone Conversations	4,937,000,000	23.9%	12,617,000,000	58.7%
Total	20,669,000,000	100.0%	21,508,000,000	100.0%

Table 13.—Comparison of Telephone, Telegraph and Mails.

governments of conducting the telephone as a branch of the postal and telegraph services, practically no European government keeps its accounts in such a manner as to reveal the true net financial result of its telephone service.

COUNTRY	PER CENT OF TOTAL MESSAGES		
	TELEPHONE	TELEGRAPH	MAIL
SWEDEN	72.6	0.7	26.5
NORWAY	61.9	1.5	36.6
DENMARK	51.9	1.0	47.1
ITALY	32.1	3.1	64.8
NETHERLANDS	29.5	1.6	69.7
GERMAN EMPIRE	23.4	0.9	75.7
BELGIUM	22.8	1.8	75.4
HUNGARY	20.4	1.6	77.8
GREAT BRITAIN	17.7	1.8	80.5
FRANCE	13.8	3.4	82.8
SWITZERLAND	13.5	1.5	85.0
AUSTRIA	12.9	1.2	85.9
AVERAGE OF EUROPE	23.9	1.7	74.4
UNITED STATES	58.7	.4	40.9

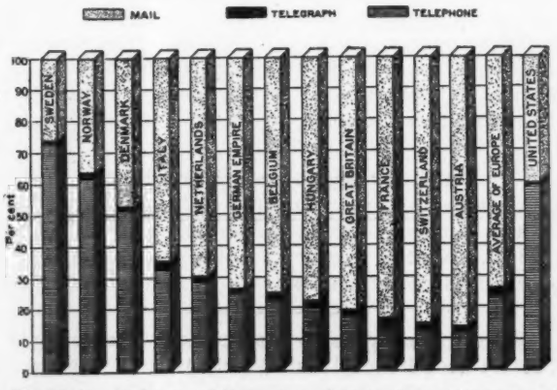


Fig. 18.—Ratio of Mail, Telegraph and Telephone Messages, 1909.

Table No. 12 summarizes the gross telephone and telegraph earnings of Europe, as illustrated by Fig. 17 It is estimated that in Europe the gross telegraph earnings are about two-thirds of the gross telephone earnings, while in the United States they are about one-fifth of the gross telephone earnings.

Referring only to the larger European States, this statistical table reveals the fact that in most of the European countries gross telephone earnings are substantially larger than gross telegraph earnings. Indeed, telephone earnings are over twice as large as telegraph earnings in four countries; in Switzerland

Type of Message	EUROPE			UNITED STATES		
	1909	1908	% Incr.	1909	1908	% Incr.
First Class Mail matter	35,533	34,766	2.2%	96,090	90,062	6.7%
Telegrams	798	769	3.7%	1,076	1,039	3.5%
Telephone Conversations	11,400	10,585	7.7%	137,882	134,335	2.6%

Table 14.—Comparison Per 1,000 Population.

they are two and a half times as large, in Germany and Denmark they are four times as large, and in Sweden, they are over six times as large. In three countries, on the other hand, telegraph earnings still exceed telephone earnings. These countries are Italy, Spain, and Russia—in the last two countries telegraph earnings are over twice telephone earnings. Finally, it is noteworthy that in France telegraph earnings nearly equal telegraph earnings. Indeed, telephone earnings are over twice

6. Traffic—Mail, Telegraph and Telephone.

Instructive as it would be to compare the traffic of the other two branches of transmission of intelligence—the mail and the

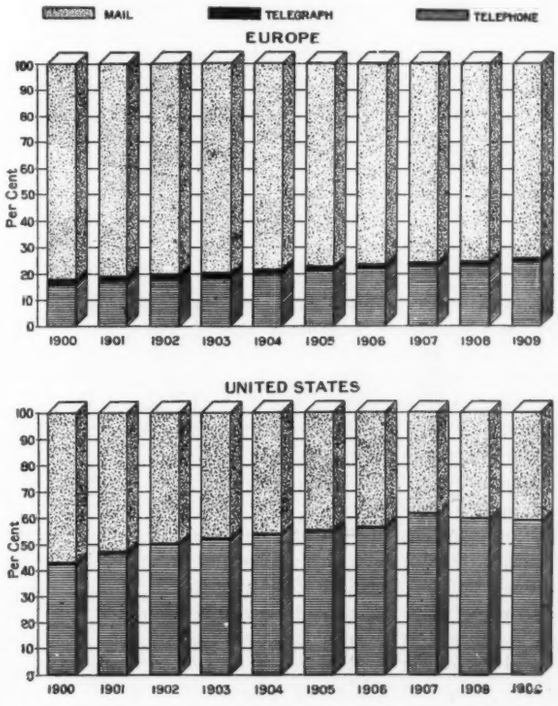


Fig. 19.—Illustrating Fig. 18 from 1900 to 1909.

telegraph—with the telephone traffic of the world, such a comparison would only be speculative on account of the lack of statistical material. There is, however, sufficient statistical information to permit a comparison of the traffic of these three services, both in the United States and in Europe, during the year 1909. The result is shown in table No. 13.

The figures show that although Europe has about three and a half times the telegraph traffic and nearly twice the first-class mail traffic, it has only one-third the telephone traffic of the United States. Table No. 14 shows the first-class mail.

telegraph and telephone traffic per 1,000 population for Europe and the United States during 1908 and 1909.

7. A Comparison With Other Industries.

The magnitude of the United States telephone investment per capita may be emphasized by comparing the telephone with some of the other leading United States industries. Such a compari-

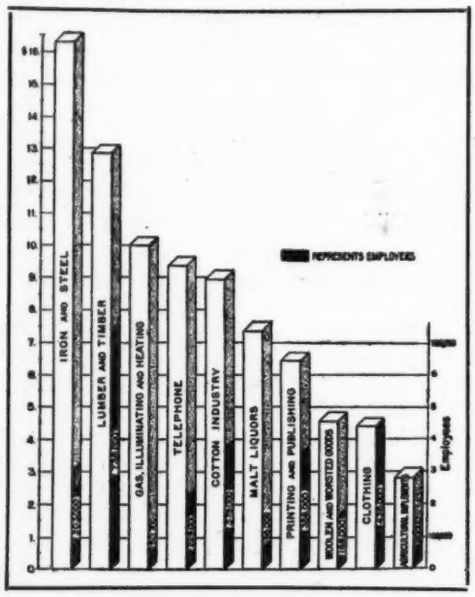


Fig. 20.—Per Capita Investment of Leading U. S. Industries and Total Employes, Jan. 1, 1910.

son is based on recent special reports by the United States Census Office, publishing the requisite data as of January 1, 1910. Fig. 20 gives the result of a comparison of the telephone business with ten large United States industries. Despite the fact that the telephone has been in use but thirty-five years, the telephone investment per capita January 1, 1910, is the fourth largest, yielding only to the iron and steel, lumber, and gas and heating industries.

Kentucky Independent Makes Rapid Gains.

The Auburn Home Telephone Co., Auburn, Ky., which began operating less than three years ago with sixty telephones connected, has now over 300. The company has just closed a deal with the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., for the installation of another switchboard of 195 line capacity, of the latest type, divided ringing and self restoring drops. This is the second board of this style, the first being filled.

The company has just about completed a rural line to Bucksville, ten miles north, which will carry four circuits, with six telephones to the circuit. The growth of the company has been so rapid that it is already concerned about its cable plant, which is all in service in a large part of its field and is filling up rapidly elsewhere. Business is reported excellent and prospects for future growth most satisfactory.

Russian Telephone Service Extensions.

The British consul at Batoum reports that telephonic communication was established during 1911 between Tiflis and Baku, Russia, and is expected to bring in a handsome revenue to the state. The standing telegraph poles were used for the purpose, and should this state enterprise prove a financial success, the system, it is reported, will be extended to other towns of the Caucasus. Wireless telegraph communication between Batoum and Sebastopol and a radio-telegraph station at Petrovsk for wireless telegraphy with Fort Alexandrovsk in Trans-Caspia were installed during the year.

International Association of Municipal Electricians.

The seventeenth annual convention of the International Association of Municipal Electricians will be held in the Hotel Jefferson, at Peoria, Ill., on August 26 to 30, 1912.

The International Association of Municipal Electricians is composed of municipal electricians from all parts of the United States and Canada, as well as from Cuba and South America. Its objects are the acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of fire and police telegraphs, light, heat and power systems; the diffusion of this knowledge among the members of the association with a view to improving the service and reducing the cost thereof, and the establishment and maintenance of a spirit of fraternity among its members.

The annual conventions have proved the source of much benefit to the municipalities represented by the members of the association and to the country at large through the information given out in the form of papers and discussions. These papers relate to matters of great importance to municipal electricians and their work, and are of the most practical kind, because they are prepared by practical men.

The officers of the association are: President, John W. Kelly, Jr., chief of electrical bureau, Camden, N. J.; vice-presidents, John Craig, superintendent fire alarm, Toronto, Canada; W. L. Riehl, superintendent of electricity, Indianapolis, Ind.; secretary, Clarence George, city electrician, Houston, Tex.; treasurer, Clark E. Diehl, superintendent fire and police telegraph, Harrisburg, Pa.; chairman executive committee, W. E. Wolgamott, city electrician, Peoria, Ill.

Birmingham Telephone Case Delayed.

Judge H. A. Sharpe, in the Birmingham, Ala., city court, has permitted the complaint of T. A. Davenport, directed against the city of Birmingham, the Southern Bell Telephone & Telegraph Co. and the Peoples Home Telephone Co., seeking to prevent the annulment of the franchise of the Peoples Home company and the sale of the physical properties of the company to the Southern Bell.

The three defendants may take the usual time in filing demurrers and the matter may go over until the next term of the court.

Fort Dodge Company Triples Capital Stock.

At a recent meeting of the stockholders of the Fort Dodge Telephone Co., Fort Dodge, Iowa, it was unanimously voted to increase the capital stock from $100,000 to $300,000. The company is planning to rebuild its system and install an up-to-date common battery plant. It is probable that a new exchange building will also be erected.

Revokes Franchises in Nebraska City.

The Tecumseh (Neb.) city council has revoked the franchises of the Johnson County Home Telephone Co., and the Bell Telephone Co. in that city. These two were recently merged, the interests having been bought by the Lincoln Telegraph & Telephone Co. If this action will stand it leaves the company now operating here without a franchise.

Railway Signal Association Meets.

The eastern division of the Railway Signal Association held its regular meeting at the Hotel Astor, New York City, on June 12 and 13. A good program was followed and a very satisfactory attendance was shown.

Western Pennsylvania Association Meet in July.

The Western Pennsylvania Independent Telephone Association will hold its next meeting on July 18 and 19, at Charleroi, Pa.

After the Ball

The Convention—Something Dead up the Creek.

By J. C. Kelsey.

Well, he came and he saw, but he did not conquer. You know the man I mean. And I suppose you sympathize with him.

Theodore Roosevelt only four years ago showed the world how to operate a steam roller. Nobody wanted William Taft. But they had to have him.

Personally I cannot see where President Taft has failed. He has the same friends and advisers that the late lamented Roosevelt had, except Gifford Pinchot, James Garfield, etc.

There is talk of a bolt, and a new party. No such device has ever succeeded.

The queer part of the whole mix-up to my mind lies in the relation of Murray Crane. Murray Crane is one of the master minds of the American Telephone Co. He is a senator for Massachusetts. No self respecting corporation of giant size can be without a United States senator.

During the telephone agitation in Roosevelt's administration nothing was done. Rumor says that all the protest matter was turned over to Murray Crane for the benefit of the Bell company.

It was almost pathetic to contemplate how dearly Roosevelt and Crane loved each other. Damon and Pythias alone equalled it.

Last week the friends of Roosevelt would have applauded Crane's crucifixion. What a fleeting thing love is.

Today the Taft administration seems to lean greatly on the broad (?) expanse of Murray Crane's bosom.

The Taft lawyers came into our telephone lives again—with Mr. Wright—and we gave all we had. I would like to know whether the telephone people gave enough good evidence or not, or if it will be forgotten.

It seems to me that before telephone people vote they should know what is to be done with American Telephone. Is Murray Crane too strong for us? And if Roosevelt in his foolish bolt has enough foolish people to vote for him to make him president, will he do something? The dear people come in beautifully before election—but never afterward.

The mountaineer who gets his drinking water from the flowing stream always knows when there is something dead up the creek.

The American people know it, too. There *is* something dead up the creek, and it is our legislative weakness. Every bit of legislation in our country is at the mercy of the constitution. If legislation, which is always for the benefit of living people, conflicts with the ideas of some corrupt judge, he can conjure up the dead, and declare the laws unconstitutional. That at least explains to me why there is great unrest.

In England, and in Canada, too, the constitution is changed to meet new conditions. In other words, the people rule.

In our own country the people cannot rule, because they are handicapped by an unchanging constitution.

In spite of the hurrah of the convention, business kept on in fine shape. The country was never in better anticipatory condition. Factories are busy, merchants are reporting good trade, and crops show great promise.

Even Wall street lost none of its composure. The world do move.

A man is foolish to go into politics. A politician is usually a pauper. Almost everything he does for the public is misconstrued and misjudged—and he gets abuse instead of praise. And so does any man who fights for any principle.

Theodore Roosevelt may be honest and sincere, yet I frankly say that I doubt it. How can a man be a friend of the people with George W. Perkins financing his campaign? It is impossible. One must be judged by the company he keeps. And if Roosevelt was sincere, his friends would not have killed the Hadley boom.

You will have to watch Herbert Hadley, the governor of Missouri. Roosevelt jealousy will not keep him down. If he were president you would get an inquiry into telephone matters.

The only reason that Hadley and his Missouri delegates were hostile to Taft was because Taft called Hadley a fresh upstart, and an accident. You can see how human these so-called big fellows are. Merely boys grown up.

So let us not lose any sleep over politics. Let's get down to business. Our own business is a peculiar kind. We were born in a fight. We do not trust each other.

Telephone manufacturers are the only producers who have no association. There was an attempt to control prices, but it failed.

No other field of endeavor has such a free field of purchase as the Independent telephone operator. The telephone operator has in the past bought some junk but he can't blame anyone but himself. His purchase was voluntary.

And I want to say frankly that many operators have grown into the notion that the manufacturers should replace their worn out devices instead of the public.

I have watched the growing tendency of some operators to send back worn out cords, broken receivers and such, and demand new devices in their place. I am not expecting any one to be ashamed for such actions, but they should be.

The public pays all charges for maintenance, reconstruction and depreciation. If it does not, that is your business, and I might say your cowardice.

One of the finest articles I ever read in TELEPHONY was the story of a company which raised its rates and stood pat. Do not show your cowardice by crowding worn out stuff on the manufacturer. Charge it where it belongs. Telephone people must get their houses in order. They have exhausted themselves fighting for fickle public favor. Of all the Medusa heads the public's favor is the most deadly.

A rich man was asked which he preferred for his son, a spendthrift or a miser. He said a miser, because he at least would not become a public charge.

That is my opinion of a telephone company. Charge the public for every service you render, and accumulate that

thing which the public alone respects—a relatively gigantic surplus.

In other words, stiffen your back and charge for your work. That alone will be appreciated. Don't fall back upon a manufacturer, who has no way of accounting for your cowardice in not charging the public for it. It is not fair.

There are a lot of topics which I intend to discuss, and they may be disagreeable. I readily realize that we have all had our troubles. I know, too, that our leaders have never been prophetic. Most of them had Independent telephone interests barking up the wrong tree.

While the convention leaders were making a big fuss over a factory, which they termed the Bellogg, the Bell company was quietly and effectively working on the sublicense game.

The first thing our rabid leaders realized, many of the Independent companies were connected with Bell lines. That condition changed the map, and today we see the realization that one telephone system has advantages.

I do not like the Bell company's definition of a connected company as a controlled company. That term may be useful in satisfying New England stockholders and Wall street, but it is a manifest lie.

But no one can deny the changing order of things and affairs. Those of us who do not recognize the march of events are soon called fossils.

There is one changing condition that I want to make plain. The Bell interests are actually learning something. I have always accused them of learning nothing new and forgetting nothing old. I have been mistaken.

I have always had contempt, too, for their ways of conducting a law suit, and have always been willing to throw my hat in the ring and go after it, and without preparation and without arms.

I have a newer respect for the Bell company, since my participation in a law suit the other day. Honestly, the Bell company will yet come into its own—it will yet get the service out of its organization to which it is entitled.

It is no great concession to the Bell company to say that it really can learn something new. It is a factor in all our progress. It may yet learn that its ways are not the only effective ones.

Monumental conceit is certainly capitalized by our Bell friends. When the Bell company becomes susceptible to suggestion, it will be surprised at how much it can learn, and how much money it can save.

Any man with any knowledge of finance knows that the present and extravagant cost of operating a trust telephone justifies a much higher earning than $39.85 per telephone station. But the public is entitled to a more economical management. And I believe it will eventually win out.

I wish I could discuss this point but I can't do it today. If the Bell company would put a stop to its pugnacious tactics and settle down to business, it could operate for less money. If it would allow some of its competitors to get along in peace it would gain, too. *If it would open the field of purchase to all legitimate telephone manufacturers it would save millions.*

If it would even avoid the appearance of monopoly, the public would soon lose its antagonism. If it would admit some of its weaknesses and confess its sins, then its trouble would be over. But will it do so?

There are thousands of influences which, if thrown in the direction of progress, would help our telephone business wonderfully.

But, so far, the Bell company sullenly refuses to influence progress, except in its own way. It knows it all and thereby makes these influences work backward.

How long will the financial interests of New York stand for a policy which cuts its own throat to spite its aching head?

Getting back to the convention, the ball is over. There are many hearts that are aching after the ball. There were many peculiar things done and the power of organization shown. Elihu Root showed his cunning, and the power of Roberts' Rules of Order. Even Theodore Roosevelt could not beat it.

Independent telephony had the same kind of organization to contend with. And it succeeded. I never realized how proud the Bell company is of its nearly three million connected telephones.

Roosevelt would have succeeded better if he had stayed away from Chicago. He talked sharply and roughly to men who were as clever as he. They resented it—and they would not bolt.

We have learned that the republic is still safe; that law and order still rule. We all know that there must be a let-up on corporation attack. Because corporations have deep troubles too—troubles that all giants have.

Great size is nothing but a fatal disease. It should terrify nobody.

There is nothing to worry about. There will be no revolution. There will be no Robespierre nor Murat—and no blood. Economic laws can but temporarily be broken.

Men have tried to corner the telephone, and have tried to tell us that it is a natural monopoly. Economic laws will prove that it is a local issue.

People will not die because a mere man wants to be president always. Our liberties will get wider and broader because that is an evolutionary necessity.

Economy will yet drive out crime and sin, because those details are wasteful. In matter nothing can be lost.

So let's smile again and try to realize that somewhere the sun is still shining, although it may not be at Oyster Bay, and that we are not going into a natural decline.

As I write I am hearing on all sides about the convention. I am passing through Mississippi on a slow train on my way to the state telephone convention at Meridian.

Mississippi cannot complain. Cotton, corn, peaches and all are flourishing. Much needed rain has fallen.

Independent telephone conditions in Mississippi are flourishing. There is still war between the Cumberland Bell and the Independents—a great deal as it was in the middle states six or seven years ago.

Service is given in such places as Corinth, Tupelo and Amory at fifty cents a month, and the state railway commission shows no disposition to interfere.

In fact they say the Cumberland Bell company can discriminate as much as it pleases. There is hope that the new Southern Bell management will extend its more liberal attitude over the Cumberland territory.

I have no doubt that Mississippi will be found in the democratic column next fall. This is as sure as taxes and death being the inevitable lot of human beings.

As far as I can see, there is really nothing dead up the creek. It is only imagination.

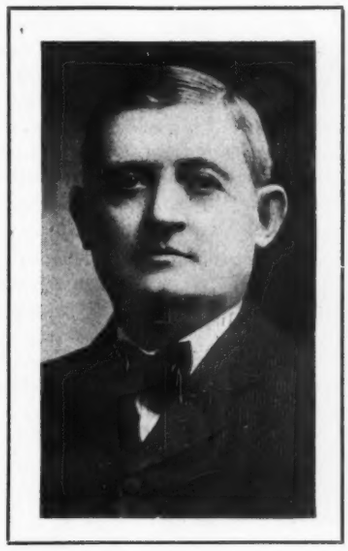
MORAL: You must pay the fiddler.

A Quartet of Men Prominent in the Telephone Field

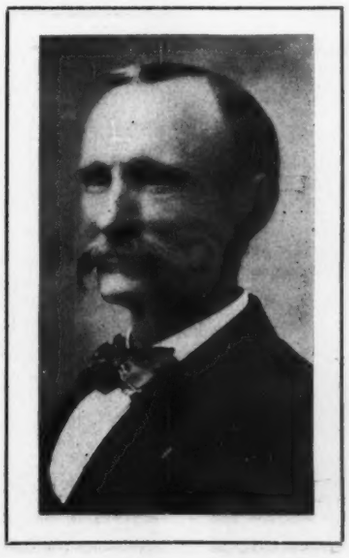
J. W. FISHER, director and general manager of the Interstate Telephone Co., Ltd., Spokane, Wash., one of the constituent corporations of the Interstate Consolidated Telephone Co., was born in Harrisville, Mich., January 3, 1867. He was educated in the grade schools of that town. In 1892-3 he was with the Nebraska Telephone Co. as lineman, trouble man and switchboard man; in 1896-7-8 he was in the long distance department of the Citizens' Telephone Co., of Grand Rapids, Mich. In 1899, 1900 and 1901 he was in the lumber business in northern Idaho, getting out material for bridges, warehouses, residences, etc. He supplied the bridge material for first railroad in the Coeur d'Alene, the O. R. & N. In 1901 the Interstate, Ltd., was incorporated and Mr. Fisher became its first superintendent. In 1904 he was made a director and its general manager. He is also purchasing agent for the entire Home system in Spokane. He assisted in bringing the Interstate, Ltd., and the Spokane Home into the Interstate Consolidated and has aided in organizing other smaller Independent companies. He is a member of the I. O. O. F.

DR. STEPHEN T. NEILL, director and assistant general manager of the Missouri Union Telephone Co., Clinton, Mo., and business manager and secretary of the St. Clair County Telephone Co., begun the study of dentistry at the age of seventeen and has been since continuously practicing his profession. In 1901 he actively entered the telephone business. He had been one of the incorporators of the Missouri Union company in 1899, and, in 1901, he promoted the Mutual United company, which sold to the Union in 1908. Dr. Neill who assisted in the organization of the Sixth District association of Missouri, has been president of the state association and three times a delegate to the national convention. He was born in Lexington, Mo., April 9, 1865, and was educated at the Wentworth Military Academy, in that city and the St. Louis and Philadelphia Dental Colleges. He is a Past Master Mason and a K. P. Dr. Neill is prominent in local politics, having served the city for several years as alderman, acting mayor, etc. He also built the city municipal light plant.

ABINGTON J. BRIGGS, general manager of the Chicago Telephone Supply Co., Elkhart, Ind., has been interested in the development and manufacture of telephone apparatus for the past seventeen years. He was born in Troy, Iowa, January 12, 1846. He was educated at the Iowa Wesleyan University and became cashier for the Adams Express Co., at St. Louis, in 1868. He remained there until 1872, when he became cashier of the Iowa National Bank, Ottumwa, Iowa. A year later he went to Knoxville, Iowa, as cashier of the Knoxville National Bank, continuing in that position for ten years. From 1883 to 1895, his time was given to the management of his private banks at Superior and Alma, Neb. In June, 1895, Mr. Briggs was one of the organizers of the Chicago Telephone Supply Co., which then had its factory in Chicago. In September, 1902, the factory was removed to its present location, Elkhart, Ind. Mr. Briggs has been a regular attendant at the conventions of the National Association and has aided, with both time and money, in advancing its aims. He is a member of the I. O. O. F.



BYRON F. WASSON, president of the National Telephone & Electric Co., Clinton, Ill., and manufacturer of the Wasson Reel, was born in Gibson county, Ind., in June, 1855. He was educated at the Union Christian College and the Kansas State Normal College, graduating from the latter with the degree A. B. He is a member of the I. O. O. F. and the M. W. A. Leaving the farm at the age of twenty-one Mr. Wasson attended school and later taught for fifteen years. At this time the Bell patents expired and he began the construction of a line from Bluffs to Winchester, Ill., building on oak poles, with the aid of a ladder in lieu of climbers. In 1892 he organized the system at Bluffs, becoming its manager; in 1898 he organized the Farm & City Telephone Co., and was elected its president; in 1904 he organized the National company, of which he has since been president. He has been a member of the national association since it was formed and of the Interstate and state associations as well, having helped to draft the constitutions of the last two bodies. He has been active in promoting and building Independent exchanges.



Chicago Independent Serves Republican Convention.

The National Republican Convention, held in the Coliseum Building, Chicago, last week, afforded the Illinois Telephone & Telegraph Co., better known as the Illinois Tunnel Co., to demonstrate its ability to meet emergencies and to handle a big situation effectively and in a manner satisfactory to the public. This was the first occasion of its kind since the Chicago Independent telephone company began its extensive operations in that city and it was met in splendid shape.

The photograph shows in a general way the arrangement of the company's booths at the left of one of the principal entrances to the convention hall—that of the national committee. Five booths were set here in an enclosure attractively railed off by white posts and heavy silk cords, with brass fittings. The booths, as well as the switchboard (a 25-line, one-position board), the desks and chairs, were finished in golden oak.

On the booths and manager's desk were mounted flashing electric signs. These, as shown in the photograph here reproduced, bore the "IT" initials of the company and the automatic dial. Uniformed pages were in attendance, neatly dressed in dark blue uniforms, with the "IT" dial worked on the coats, and wore caps trimmed with gilt. They were in constant requisition during the sessions, calling delegates to the Independent telephones. Advance copies of the company's new directory were obtained for this occasion, and a large amount of local, and some long distance, business was handled.

Besides the booths here shown the company had another near the main entrance connected direct with the local exchange. This comprised the service for the delegates and the general public and it was frequently operated at capacity during the sessions, at which times even the operator's set was requisitioned and pressed into service. Hundreds, however, were turned away, unable to secure attention at the rush seasons.

Direct telephone and telegraph lines also were run from the hall to the principal daily newspapers in Chicago. Besides the connections at the Coliseum, the company ran private lines to the headquarters of the two principal candidates for the nomination—to the Taft organization, in the Gold Room of the Congress Hotel, and the Roosevelt headquarters in the Florentine Room.

Frank L. Eldridge, special agent for the Illinois Telephone & Telegraph Co., was in charge of the company's service during the convention, securing the location for the booths, attending to the installation and afterward to the supervision. It was largely due to his efforts that so satisfactory a showing was made for the Independent company in Chicago. He was assisted by Miss L. Rutledge, one of the company's most efficient operators, who was at the switchboard during the convention sessions. In the photograph Mr. Eldridge is shown standing at the left, in the center and Miss Rutledge at the right, within the railing.

Begin Investigation of Chicago Independent.

Immediate investigation of the Illinois Tunnel Co.'s right to operate the automatic system in Chicago was authorized recently by the city council committee on gas, oil and electric light. Eric J. Everett was selected for the auditing, to decide whether the telephone company had 20,000 subscribers on June 1, 1911, according to the terms of the franchise.

Richmond Home Raises Rates.

The Richmond Home Telephone Co. of Richmond, Ind., has notified its more than 3,500 local patrons that beginning July 1 the annual rates will be increased $3. When a franchise was granted the company by the city council several years ago a provision was included which gave the company the right to increase its rates 25 cents a month on every telephone when its total patrons reached three thousand, and it is under this provision of the franchise that the increase in rates is made.

How the Illinois Telephone & Telegraph Company (Independent) Furnished Service at the Republican National Convention, Chicago.

Federal, of Buffalo, Opens New Salamanca Exchange

Description of Formal Opening of Enlarged Independent System in New York Town—Brief History of Plant Which Began Operations January 1, 1901, with 225 Subscribers—New Board Can Handle 9,600 Subscribers, Iustalled Capacity Being 2,400.

The Federal Telephone & Telegraph Co., of Buffalo, N. Y., recently opened its new exchange in Salamanca. The opening, under the direction of J. S. Munger, manager of the exchange, was a signal success, over one thousand persons attending. Invitations were mailed to the company's subscribers and patrons and to the general public. A special invitation was extended to all the school children of the higher grades who were received from four to six o'clock in the afternoon. The adults, subscribers and general public were received in the evening from seven to eleven. The company played the host in a most acceptable manner.

All visitors were conducted through the operating room by competent guides, where the switchboard and the method of operating were fully explained; from there they were conducted through the terminal and wire chief's rooms, the guides explaining the functions of the equipment in detail. From the wire chief's room the guests entered a spacious ballroom, adjoining the exchange rooms, where an orchestra played lively dance music to the vast entertainment of the guests. On entering the ballroom each guest was presented with a miniature desk telephone decorated with a white satin ribbon, on which the name "Federal Telephone" appeared. In a reception room just off the ballroom light refreshments were served.

New Board of Federal Company at Salamanca, New York, Exchange.

The switchboard, terminal, wire chief's, ball and reception rooms were beautifully decorated with large American flags, cut flowers and potted plants, while the red, white and blue shield, emblematic of the Independent telephone, blended well with the color scheme. Placards, giving a few pointed facts relative to Independent service, and its advancement in Salamanca, were prominently displayed.

As the guests left they were handed a folder picturing the exchange room and giving a brief history of the Federal company, in Salamanca.

Mr. Munger was assisted by D. V. Bradley, of Wellsville, N. Y.; C. Whitwood, of Bolivar; J. Van Arman, of Salamanca, who explained the switchboard and its operation; Max Lundregan and A. M. Forster, who explained the mechanical part of the board; J. A. Roberts and W. J. Kennedy, who showed the terminal and power room equipment; and L. W. Shipman, who described the four-party selective apparatus. Miss Ethel Zimmerman and Miss Inez Hohman were in charge of registration of guests and distribution of souvenirs.

The officers of the company who attended were B. G. Hubbell, president; B. L. Moore, secretary; J. D. Pugh, treasurer; and H. M. Dixon, superintendent.

The Salamanca Telegraph & Telephone Co. built one of the first Independent telephone exchanges in New York state. The company was organized by Hudson Ansley, who was its first president, Charles Gibson, Dr. E. Bolard and other citizens of Salamanca, about September, 1899. The political horizon being troubled, the company "marked time" for a while.

On November 5th, 1900, after awaiting the outcome of the presidential election, the first order was placed for material for the construction of the plant and, shortly after, active work began. Up to this time there were approximately 195 telephones in operation in Salamanca. The Independent exchange opened January 1, not quite sixty days after placing its first order for material, with a subscriber's list of 225. The equipment installed was the best obtainable at that time.

The exchange gradually grew until it reached a list of over 700. It outgrew its capacity and, in 1911, it was decided to entirely re-build the plant and bring the equipment up to date. As a result, it is declared that today there is no better telephone plant in the country than the one now operated at Salamanca by the Federal Telephone & Telegraph Co., with which company the Salamanca Telegraph & Telephone Co. was merged in 1910. The present system, common battery, is thoroughly modern and up-to-date in every detail.

Within the city limits of Salamanca the company has installed 31,258 feet of underground conduits with sixteen manholes. The cable system represents a total length of 36,250 feet, containing 868 miles of copper wire.

The equipment was manufactured and installed by the Century Telephone Construction Co., of Buffalo. The switchboard is Century Type No. 10, common battery, multiple, harmonic ringing, with eight positions installed, of which there are five equipped—four local and one toll.

The local positions are each wired for 140 lines and fifteen cord circuits, with 120 lines and fifteen cord circuits equipped.

All cord sets are equipped with individual selective keys and double lamp supervision. The toll position is wired for forty lines, six toll to toll and six toll to local cord circuits, with twenty lines and all circuits equipped. The multiple equipment is the four panel type, complete for local and toll positions, with ultimate capacity of 2,000 lines. There are twenty recording toll trunks wired, of which ten are fully equipped.

The power equipment consists of National storage batteries Type V-13, installed capacity 240 ampere-hours; ultimate capacity 280 ampere-hours. The ringing equipments consists of a duplicate set of four-party harmonic converters. The charging equipment installed consists of two complete sets; the first being 110 volt, sixty cycle, three phase, A. C. motor, direct connected to a 350 volt generator with an output of 1.2 K. W.; the second, a one five H. P. gas engine belted to thirty-five volt generator with output of 1.2 K. W.

The main distributing frame and protection is combined; the protection is of the heat coil and carbon arrester type, 480 pairs of connectors and 624 pairs of line terminals being installed. The wire chief's board is the cordless type.

The opening aroused much favorable comment on the part of the local press and proved a valuable advertisement for the company.

Attacks Constitutionality of Utilities Law.

A San Francisco dispatch says that suit to test the powers of the state railroad commission, in an attack on the constitutionality of the public utilities act, which went into effect March 23, is foreshadowed in the attitude of the Pacific Telephone & Telegraph Co. in a hearing before the commission of the Glenn County Telephone Company's request to force the larger corporation to connect the systems.

The Glenn County company joined in the request of the Tehama County Telephone Co. They desire toll service connection at Red Bluff and at Willows, and the answer of the Pacific Telephone & Telegraph Co. is an attack on the constitutionality of the public utilities act, and particularly of section 40, which gives the commission jurisdiction over telephone companies.

Hunt Chipley, a New York attorney, is in charge of the company's case. If the commission orders the larger corporation to permit the others to connect with its lines, it is evident that suit will be filed to test the constitutionality of the act.

The Glenn and Tehama county companies are owned by farmers, and operate in farming communities. Sheriff Judd W. Boyd, of Tehama county, and E. L. Sisson, treasurer and tax collector of the county, have testified to the excellence of the two systems that desire connection with the Pacific. A. S. Lindstrom, engineer for both companies, testified that they had more business in the territory than has the Pacific company.

Plans of New Kansas Company.

TELEPHONY is advised that the Kansas Central Telephone Co., recently incorporated by Abilene, Salina, Beloit and Plainville interests, with a capital stock of $100,000, has been organized for the purpose of developing the telephone field in central and western Kansas. The headquarters of the company will be at Plainville, Kans.

At present the company owns the exchange at Plainville and the toll lines extending from Plainville in all directions and reaching as far east as Lincoln Center, Kans., at which point connection is made with the lines of the Salina Telephone Co. At Stockton, Kans., connection is made with the lines of the United Telephone Co. These three companies are closely associated and expect to greatly improve and extend the long distance lines in the northwestern part of the state.

It will be the policy of the company to co-operate with existing lines and exchanges and to assist in getting the companies who are not able to build good lines to do so. The officers of the new corporation are: J. O. Wilson, president, Salina; A. T. Rodgers, vice-president, Beloit; C. L. Brown, secretary and treasurer, Abilene; O. T. Kimmel, assistant secretary and treasurer, Plainville.

Bell Fixes Two-Rate Plan in Louisville.

Following the ruling of the United States Supreme Court, sustaining an ordinance fixing maximum telephone rates in Louisville, the Cumberland Telephone & Telegraph Co. has announced that, after July 1, there will be two rates for city subscribers—one the ordinance rate, the other a "metropolitan" rate.

The ordinance rate does not provide for free service to suburban towns; the metropolitan rate does. The "metropolitan" rate is exactly the same as at present and the service to stations outside the corporate limits connected direct with city exchanges is free.

For subscribers taking the ordinance rate toll charges to these towns after July 1 will be as follows: Jeffersonville, New Albany, St. Matthews, Pleasure Ridge Park and Harrod's Creek each five cents; Anchorage, Fern Creek and Jeffersontown each ten cents; Pewee Valley, Shepherdsville and West Point, each fifteen cents.

The supreme court decision, as reported recently in TELEPHONY, materially reduced the schedule of Bell rates now in force.

Los Angeles Council Will Not Modify Rates.

The telephone rates fixed by the Los Angeles, Cal., Board of Public Utilities for the year commencing July 1 will go into effect on that date without change.

The council at the conclusion of a recent public hearing denied all protests against the rates and instructed the city attorney to draft an ordinance establishing the rates fixed by the utilities board.

After the hearing John G. Mott, representing the Pacific Bell company, said that the company would take the matter into the courts with a view of preventing the rates from going into effect.

The grounds of the company's contention will be that the new rates are unconstitutional, unjust and unfair, and will result in confiscation of property.

Refuses Exclusive Bell Franchise Offer.

The city council of Jacksonville, Fla., has refused, by a vote of thirteen to three, to grant the Southern Bell Telephone Co. the right to operate without competition in that city. The proposition was made by the Southern Bell with the hope of blocking the granting of a franchise to Independent interests, headed by A. S. Metzner, who propose to install the automatic system in Jacksonville.

It is stated that, had the franchise of the Independents been altered in a few minor details, which have been agreed to and which are now being taken care of by a council committee, it would unquestionably have received a favorable vote at this meeting. It is not doubted that, when again presented, it will be passed with little, if any opposition.

Copper Advances to Seventeen and Three-Fourths.

Copper has now advanced to seventeen and three-fourths cents a pound, while the demand is reported good. Producers are reported fairly well satisfied with the present situation.

Queries on Theory and Practice

Grounded Telephone Trouble.

I have a telephone set on one of our single wire ground lines that does not work well. The set is a good one, of a reputable make, and has a 5-bar generator and a 1,600-ohm ringer. At times it will work well and you can hear from it—it will both transmit and receive. Then probably the next time it is used conversation can scarcely be heard, the parties appearing to be at a long distance. I put on a new transmitter and cord, new receiver and cord, but none of this does any good. I tried new batteries, then got a second set and put them in, and they were new to my knowledge. All the connections are perfect. The hook-switch makes good contact. I have examined all connections on the induction coil and condenser as the box is equipped with a condenser. I have also a Multi-discharge lightning arrester on the wall above the box.

From the account which you give we are led to suspect variable and high resistance somewhere in the line leading to this station or in the ground connection. Make a thorough and minute inspection of all the joints from the main line to the telephone. Pass none that look the least suspicious and remake them so as to be sure. Then follow on to the ground and give it a thorough overhauling. It may be that the ground has dried out, or that there is a bad connection between the wire and the ground rod.

As a last resort, the telephone itself might be replaced, although the trouble will probably be cured by getting the line and ground into shape as indicated.

A Higher Voltage at Telephone than at Main Battery.

I want to ask the reason why we get a higher voltage reading at the end of a telephone line than we do at the main battery. The battery is 55 volts, automatic switchboard, three-wire type. Across the river we get 65 volts from the line to ground. At other tele-

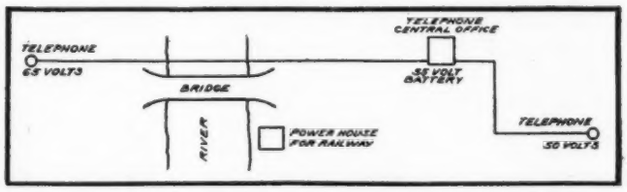


Fig. 1.—Relation between Power Plant and Telephone.

phones on this side of the river we get usually from 55 volts down to 50 volts or slightly less. We expect less voltage on account of line resistance, but why should it ever be greater? I enclose a rough sketch showing the location of exchange and telephones. (See Fig. 1.)

From the location of the power house which you have indicated, it seems reasonable to presume that the higher voltage found across the river, comes from leakage from

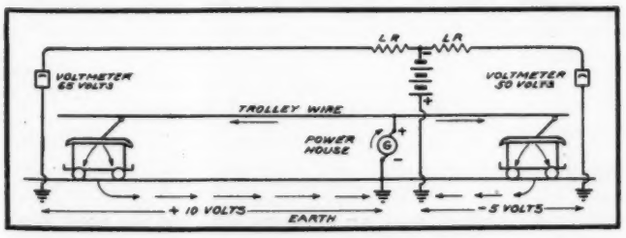


Fig. 2.—Cause of Changed Voltage.

the return circuit of the street railway. In no case is it due to the resistance of the telephone line, for the voltmeter takes so little current that here is no appreciable loss of voltage on this account.

The current leaking back from trolley cars on the other side of the river will oppose the return current of the telephone line, and so raise the voltage as measured at the telephone. This condition is shown in Fig. 2. The power generator, *G*, which supplies current for the cars has its negative terminal grounded and its positive terminal attached to the feeders and trolley wire.

This causes the current to flow as arrowed. The telephone battery has its positive terminal attached to the ground. Hence its acts in a direction clockwise around the

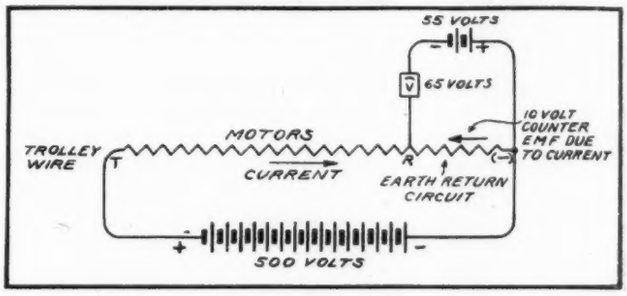


Fig. 3.—How Counter E. M. F. Acts with Telephone Battery.

circuit including the voltmeter which indicates the 65 volts. But the counter *EMF* of the earth resistance also acts in the same direction so that both are added together, making the higher voltage.

The action of the counter *EMF* of resistance is more clearly shown in Fig. 3, in which the elements of Fig. 2 are arranged in schematic form. The generating dynamo is represented by a battery of 500 volts, from the negative terminal to the point T. The load of the motors is represented by simple resistance, from T to R. The resistance of the earth and rail return circuit is given between R and (—), the negative terminal of the battery.

The current from the 500-volt generator flowing through the earth return circuit encounters resistance, which creates an opposing voltage of ten volts, acting to the left as arrowed. The voltmeter being inserted at "V" measures the sum of the telephone battery, 55 volts, and the counter voltage of resistance, 10 volts, making the total of 65 volts.

The case of the other telephone which measured lower, i. e., 50 volts, is caused by the flow of earth current in the opposite direction.

Painting Cable to Remedy Crystallization.

We have been experiencing quite a little cable trouble due to crystallization causing wet spots to develop during storms. We are considering the advisability of painting the cable with a good grade of roof paint, but hesitate fearing some unforeseen complications might arise.

We shall be very glad to have the experience of any of your subscribers who might have tried this out.

The painting of the crystallized cable armor would give at best only temporary relief. If cable is purchased from a manufacturer who will guarantee a percentage of tin in the sheath, it is probable that no further trouble will be experienced from crystallization.

Franchise Forfeiture Hearing at Seattle.

A hearing will be held by the Seattle, Wash., city council on July 8 on the question of forfeiting the franchise held by the Independent Telephone Co., which has recently been formally absorbed by the Pacific Telephone & Telegraph Co. If the franchise is forfeited the company will have to remove its poles and other physical property from the streets within ninety days or they will revert to the city.

Legal Cases and Decisions

By A. H. McMillan

Liability for Operators and Estate.

The telephone company let a contract for the operating and maintenance of switchboard at $3.41 per subscriber and 15 per cent. of original calls.

We have a partial night service, rural lines and doctors connected to a small switchboard in operator's dwelling at a rate of fifteen cents per call, said fifteen cents going to operator. One night recently a party called for Dr. A. The operator through mistake connected the party with Dr. B., who got the job. Now has Dr. A any grounds for damage, and, if so, who is liable, company or operator?

The question of liability in the above case depends largely upon the way in which you advertised your service. If, in your advertising and rules you stated that the operator was conducting your switchboard under contract, and that you would not be liable for the operator's mistake, you might be excused from liability. Otherwise, we think the mistake of the operator would be your mistake, and that your company could be held for it.

A House Moving Ordinance Upheld.

Declaring that the trial court should not be asked to pass on the constitutionality of a city ordinance, Judge Diebell, at Duluth, Minn., in a decision in the case of Duluth Telephone Co. against Andrew Anderson upheld the act of the municipal council. He declared that telephone companies must pay for the readjustment of wires when it is necessary in the moving of houses along the thoroughfares of Duluth.

The evidence showed that Anderson secured a permit to move a building along certain streets and avenues, in the city and that the progress of the undertaking was impeded by the presence of telephone wires owned and operated by the plaintiff. The latter was asked to let the wires down so that the building could be moved along, and after complying with the request sent Anderson a bill for $61, which he refused to pay.

In his opinion Judge Dibel says: "To my mind, the legislation embodied in the ordinance is harsh and unwise, but I am not passing upon its wisdom. The court is asked to say that it is unconstitutional. Looking at it from a purely indifferent standpoint, it would seem just that the house mover should pay. The telephone company, however, is a free trespasser, tying up to buildings which it does not serve and passing over property which gets no service from it. The company ought to be, and doubtless is, relieved of many requests for raising the wires.

The plaintiff is granted a valuable right when it is allowed perpetually to use the highways without compensation in carrying on a business, which, though public serving, is properly undertaken for private gain. The defendant asks to interrupt the plaintiff's business but for a few moments. Of course under the guise of police power, an unreasonable burden cannot be put upon the company. There is no claim of such thing and no issue upon it is tendered. In my judgment, the question whether the company should be required to raise its wires at its own expense, is a legislative question and not a judicial one. The trial court should not hold that the ordinance is unconstitutional."

Free Service Provision Repealed by State Law.

A franchise of the Kenosha Home Telephone Co., granted by the city, required the telephone company to give the municipality free telephone service. In 1907, a law was passed providing that if any public utility corporation should collect or receive from any person or corporation a less compensation for service rendered to it than is collected from others, it shall be guilty of an offense. This law was held in effect to amend the franchises of all existing public utilities.

At the time the franchise was granted, the state law authorized telephone corporations to use the streets of municipalities, subject only to their rules and regulations. Under these circumstances, the franchise, which provided for the giving of free service to the city was held to be not a contract, for the municipality could not barter the exercise of its police power for free telephones. It was also held that the municipal corporation, being a state agent, could not enter into a contract with the telephone company which is not subject to an amendment by public utility laws enacted for the general public weal.

This decision was made in the suit brought by the city of Kenosha against the telephone company to enjoin it from charging telephone rentals for certain telephones furnished the city. The telephone company had ceased to furnish free service because it was notified by the Wisconsin Railroad Commission that it was unlawful so to do. City of Kenosha vs. Kenosha Home Telephone Co., 135 N. W., 848.

No Obligation to Make Physical Connection.

In the absence of constitutional or statutory requirement, the obligation of a telephone company, as a public service corporation, to furnish service without discrimination, does not, as a rule, extend to making physical connection with the company's lines. So the Supreme Court of North Carolina recently decided.

Where such connection has been voluntarily made under a fair and workable arrangement, and the continuous line has come to be patronized and established as a public convenience, such connection may not be severed by one of the parties in breach of the agreement, but must be continued; such duty extends to the assignee of a contract running to its successors and assignees who have full knowledge of its existence, or facts which would have put them on inquiry leading to knowledge thereof. So the decision continued in the same case.

The rates provided for by the original contract discriminated between the company's patrons receiving like service under like conditions, and in some cases were so unreasonable and burdensome as to render the company unable to properly perform the duties imposed by its charter.

This particular contract was held to be null and the parties, except the parties to the assignment, allowed to continue the service under such reasonable rates as might be agreed upon, or provided by the public authorities. Clinton-Dunn Telephone Co. vs. Carolina Telephone & Telegraph Co., 74 S. E., 637.

Guy Wire Charged with Electricity.

A lineman of an electric light company brought suit for injuries received from a guy wire becoming charged with electricity. It was held that the question of whether he assumed the risk of such an accident was for the jury, especially where a company had notice of the defect in its appliances at the place where the accident occurred.

Evidence that the guy wire had become charged on two former occasions, and that on such occasions was not properly repaired, was held to be admissible in evidence to show the company's knowledge of the defective situation. Huber vs. Twin City General Electric Co., 134 N. W., 980.

Practical Subjects—Letters and Discussions

More About the Cperator's Working Hours and Salary.

I read in last week's TELEPHONY of F. W. Swift's method of handling operators, and wish to state my method. We have seven operators and they work in shifts as follows: One from 6:30 A. M. to 12:00, noon, another from 7:00 A. M. to 11:00 A. M., and a third from 7:00 A. M. to 12:00, noon; a long distance operator works from 7:00 A. M. to 12:00, noon. The afternoon operators work as follows: 11:00 A. M. to 4:00 P. M.; 11:00 A. M. to 4:00 P. M.; and the long distance operator from 12:00 A. M. to 5:00 P. M. In the evening the periods are: 5:00 P. M. to 8:30 P. M.; 4:00 P. M. to 8:30 P. M.; 5:00 P. M. to 8:30 P. M.; and from 5:00 P. M. to 8:30 P. M. for the long distance operator. The night operator is on duty from 8:30 P. M. to 7:00 A. M. This schedule provides for each operator working eight and one-half hours a day. On Sunday the schedule is from 7:30 A. M. to 1:00 P. M. for one operator and 1:00 P. M. to 6:00 P. M. for another and the night operator works from 6:00 P. M. to 7:00 A. M. Monday morning. An extra operator is on duty from 6:00 P. M. to 8:30 P. M. as that is the busy period on Sunday due to long distance calls.

Our exchange covers over 600 miles of long distance lines and is one of the largest in the South. The Lakeland exchange has 550 telephones connected with it.

We start new operators at $20 per month and pay them while learning, after which they receive up to $35 per month. We also give them two weeks' vacation with pay. We believe in paying good salaries to operators as it pays in the end.

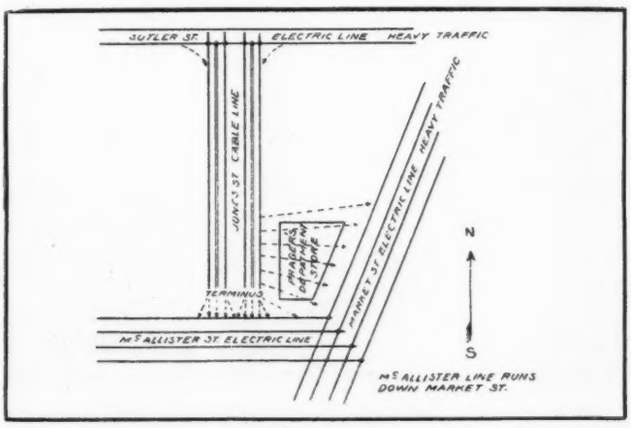
A. D. Leonard, Manager,
Lakeland, Fla. Peninsular Telephone Co.

An Unusual Case of Electrolysis.

I come in contact with many people in different occupations and recently had a conversation with an architect who told me of an interesting problem he experienced in building a department store in this city. This may not directly interest telephone men but I think it will interest electrical men in general.

This store which is known as Prager's Department Store, is situated on the northeast corner of Market and Jones streets.

The store obtained its water supply from the water company and to economize in the water bills, drilled a well. The well water was used in conjunction with that of the water company, using part for the elevators and part for sanitary purposes. At the end of the month it was noticed that the water bills were not lower than the previous month but higher.



Digram Showing Electrolysis from Car Tracks.

The architect's attention was called to this and upon investigation, he found that all the floats in the water tanks of the toilets had become porous. Some were in such a condition that they could be squeezed like a sponge. This porous condition permitted the water to run at all times. A plumber was called in and he suggested electrolysis as the cause.

TO WIRE CHIEFS AND MAINTENANCE MEN.

Clearing of troubles which occur in your exchange, inside or outside, may be made the subject of short, practical letters which will interest other telephone men These TELEPHONY *will gladly publish, if illustrated by diagrams or photographs. Simply write a description of the nature of the trouble, tests and location, cause found, and method of repair. Payment will be made for all letters published.*

An electrical engineer was taken over the building and by testing for a difference of potential between the drainage and the water pipes, found that considerable current was flowing between them. By placing a good electrical connection between the water and drainage pipes at their entrance to the store, the electrolysis and the eating of water floats was eliminated.

The presence of this foreign current caused the electrical engineer and the architect to become interested as to the source of the current. Upon investigation they found that the tracks being bonded together at Sutter and Jones streets, and not at Jones and Market streets, caused the return current to the power house to take the course of least resistance through the water and drainage pipes. The water supply comes down Jones street and the drainage pipes along Market street.

San Francisco, Cal. LeRoy S. Hubbell.

New England Bell Pension System.

A minimum pension of $25 a month and a maximum pension of $100 a month are the principal features of a new pension system which the New England Telephone & Telegraph Co. has announced it will put in effect on July 1. After twenty years of service an employe of the company may be pensioned for disability when sixty years old; when sixty-five he may retire on a pension of his own volition; and at seventy retirement is compulsory unless the board of directors decides to make an exception. Employes are not called on to make any contribution toward the maintenance of the pension fund.

A Wire Chief's Point of View.

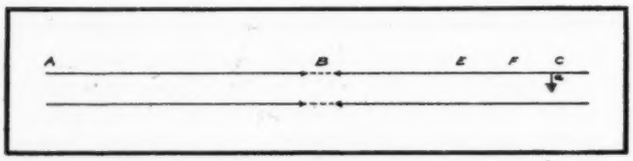
It seems to me that the clearing of trouble on any exchange should be a very important part in the daily routine on any exchange, and it also appears to me to be somewhat neglected. That is, the trouble is always cleared but it sometimes takes a day to clear trouble which should be cleared in a couple of hours.

This is sometimes the lineman's fault and sometimes the wire chief's fault, usually the latter. Sometimes it is the company's fault in not providing the testing equipment that is required. For example, I know of two large exchanges where the testing is done with a high resistance voltmeter. No shunt is provided with these voltmeters. Now, if any engineer can tell me how to measure low resistances with a high resistance volt-

meter without using a shunt, I shall be glad to learn the system.

I have worked as a troubleman for one of these wire chiefs and know that he had no such system, because all the advice I could get from him was that the line was short or grounded, as the case might be.

In measuring trouble with a voltmeter and shunt, you can



Method of Locating Trouble on Toll Line.

not tell a man where to find the trouble to a certainty but you can tell him that the trouble is not over five miles out, if that is what the measurement indicates. It is very plain to any electrician that, if the trouble measures only five miles out, all the grounds or shorts put on that line beyond that point would not make the trouble test closer to the tester.

Some trouble men think that this is impossible, while we know that it is not and we also know that the process is very simple.

I worked on one exchange that had a toll line about 80 miles long. Of course a man didn't drive over this line all the way. It had a toll station at about its center point. The wire chief would test the line in the morning and if it showed trouble, he would call up the town at the central point and get an open test which narrowed to the trouble some, about one-half. But, 40 miles is some distance to trace. Next he would send a man on the train to a small town stationed somewhere near the central point of the half of the line which showed the trouble.

Now, referring to the diagram, if the trouble were between *B* and *C* as at *a*, a man would be sent on the train to *E*, which in this particular case was 18 miles from *C*. He could open the line at *E* and then would know whether to come back to *B* or drive on to *C*. Suppose he hired a team and drove toward *C*. By the time point *F* was reached, it would be dinner time. After dinner the man would drive on to *C* and locate the trouble at about two miles from *C* at the point *a*.

I have taken these trips many times and know these to be facts. This same wire chief owned a bridge, for what, I know not, as I have never seen him use it. Any engineer will say that I am right in saying that with his bridge he could have made a Varley test on this line and told the trouble man that the trouble was about two miles this side of *C*. The man could have taken the train to *C*, hired a single rig at *C*, and cleared his trouble long before noon.

The saving by this method would have been the difference between a team with a driver, and a single rig, $1.50, dinner for driver, 25 cents, and team feed, 50 cents, also whatever that line could earn in long distance messages between 10 a. m. and 2 p. m. Now, if this were taken from the wire chief's pay for that day, where would he get off at? Don't you think that a man who could have made the right kind of a test, would be worth more money? When I was there they had been doing that same thing for ten years and I expect they will for the next fifteen years. But why? That's what I want to know.

I went to the wire chief and told him that he could save money by using the bridge. He was insulted and wanted to know who would teach him how to use the bridge. I told him I would, but he refused aid. I then told the plant chief. He looked wise at me—thought probably that I had better mind my own business and that they were doing about as good as could be done. I didn't get fired because I had always got the trouble when sent and tried to do right.

I have worked for one company that appreciated my trying to save money. It seemed to think that a maintenance man can't figure in dollars and cents, only in ohms, amperes and volts. But I must say that in order for a wire chief to figure dollars and cents, he must be able to figure ohms, volts and amperes.

There are more tricks to being a good wire chief (that is from my point of view) than using a bridge or shunting a voltmeter.

Illinois. A Wire Chief.

Steamers Connected by Telephone.

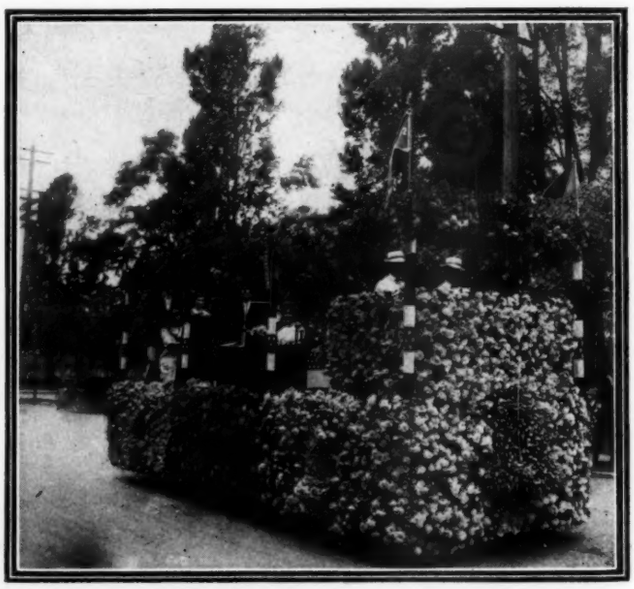
The New York Telephone Co. has found its latest field for public telephone activity on the large trans-Atlantic liners sailing out of New York, says the Telephone Review. On several boats of the Cunard Line coin box telephones have been installed. As soon as the steamer reaches her pier and before the passengers start to come ashore the public telephone department's attendant goes aboard, carrying with him a flexible cable, one end of which is plugged into a jack box on the wharf and the other end of which he plugs into a jack box on the steamer and connects the coin box telephone with the central office. Passengers are then in a position to immediately telephone to home, hotel or office.

The company has also closed a contract to equip the boats of the New York & Porto Rico Steamship Co. with portable sets, which permit telephone communication while the ships are moored at the Brooklyn company's piers.

The Portland Rose Festival.

In June of each year Portland, Oregon, has an annual celebration, which is looked forward to by many people. This is the Rose Festival, the fame of which has become known in all parts of the United States. During this festival a parade takes place, which is known as the floral parade.

Decorated floats form a prominent feature in the parade, and one such is shown in the illustration. It is the automobile float representing the Bell telephone company, and attracted great attention all along the route of the parade. The float carried switchboards, operated by exceptionally attractive looking operators. They paid strict attention to business, thus giving testimony of the discipline which prevails in the operating room.



A Telephone Float in the Floral Parade, Portland, Oregon.

The exhibit, as shown in the illustration, was banked with thousands of fine roses, which formed pleasant surroundings for the operating force at the switchboards.

Sparks from the Troubleman's Department

Remarks by Mr. Oldsubscriber.

By R. D. Mock.

"Have you got a cigar I can borrow for a little while?" asked Mr. Oldsubscriber, stepping quietly into the manager's room.

"Say," replied the manager, "I believe you are a sort of a sponge. You are one of those people who seem to take a delight in travelling around the country, seeking whom they may sponge off of. Of course I've got a cigar, but I am going to keep it right here in my little vest pocket, just over my loving heart. Now you are all the time delivering moral discourses, suppose you let us have one on the subject of sponges. I believe you can draw upon your past experiences and deliver quite an address."

"I was never so misjudged in all my life," declared Mr. Oldsubscriber in an injured tone. "To think that I, an expert on national issues, should live to be called a 'sponge' by a man whom I have endeavored to uplift! In regard to the small matter of the cigar, I feel that I was simply requesting my just due. A laborer is worthy of his hire, and if an expert on the political situation devotes some of the best hours of the day in a futile endeavor to make a telephone manager out of a man who merely bears that title, he surely has earned a two-for-a-nickel smoke. Here goes:

"A sponge is an animal, just as much as a horse or a cow. It is a harmless creature, and when it dies it transmits to its skeleton its principle bid for fame—the ability to soak up things. Now let's come back to the human family.

"We find men who resemble sponges, just as we find men who resemble other animals. Some men, you know, take the monkey as the model for their existence, while others strive to follow in the footsteps of some gentleman mule. Others take after those four-footed creatures that want it all. In fact, this continual striving to develop animal characteristics is to my mind one of the strongest reasons for believing in evolution. Yet when I look at some of my fellowmen I get to wondering if we have really got as far as the evolution part of the performance.

"Now there are two ways a man can play the wily sponge. If he cultivates the opportunity to get a meal of victuals or a glass of the stuff that made Milwaukee notorious, without any intention of ever paying it back, then he is a sponge. If he does it twice, he is a worse sponge. If he does it half a dozen times, his friends will always be found where he isn't. That's the kind of a human sponge we know the most about.

"But there's another kind even more common. I refer to the man who soaks up all sorts of information, and absorbs ideas like a waterspout sucks water. He takes them all in and there they stay. His mind is a vast store-house of knowledge set in the midst of a boundless desert. His brain is a safety deposit vault with all the keys lost. A priceless idea, which would make some man's fortune, is tucked away in his miscellaneous file and evermore forgotten.

"Now let's be specific. You attended the last national telephone convention. I don't know your real purpose in going, whether it was to meet the fellows, hear the speeches, inspect the new things or whether you went just for the ride, like the Irishman who went to the funeral. But the fact remains that you went. I remember the day you came back. You were filled to overflowing with enthusiasm for what you called the greatest business on earth. You got such a bunch of new ideas at the convention, you said, that it was a shame to take them when the membership fee was so low. You got a similar bunch the year before, and the year before that. Every convention you have attended has filled you with the same enthusiasm and has given you the same amount of new ideas. Have you used them? Man alive! You're the sponge! Suggestions that would make this business hum have been soaked up by the back part of your brain, and there they are, instead of being put to work.

"Come to think of it, there is still a third kind of a human sponge," continued Mr. Oldsubscriber. "I refer to the man who refuses to give credit where credit is due. The worst sponge you can think of is the man who uses his neighbor's telephone all the time. The worst sponger I can think of is the chap who uses somebody else's mental products without giving anything in return."

"Ouch!" said the manager, "I'm hit twice in the same spot. I'll plead guilty to indictment number two, there's no way to get around that. But the way to escape number three is quite plain. Won't you have a cigar on me?"

"Don't care if I do," returned Mr. Oldsubscriber. "Well I must meander along. Sam Bly and I are going to decide this Republican candidate question today. I'm for Taft, but Sam believes we ought to give the Colonel another shot at it. What do you think?"

"You Were Filled with Enthusiasm."

The manager grinned. "I think I ought to resurrect my old note book and study out a way to apply some of those numerous ideas I have been accumulating for the last ten years," he said.

Mistakes made over the telephone are sometimes as humorous as they are serious. One is told involving the suburban woman and her husband.

"You know," she said, "I wanted to persuade our hens to lay in the nests we had provided for them. So I telephoned my husband to bring home a couple of artificial eggs with him."

"Well, and didn't he?"

"Didn't he? He brought home a pair of cork legs."

Speak gently to the telephone,
Don't holler in its face.
Just try to think how you would feel
If you were in its place.

—Telephone Talk.

A Belmont (Philadelphia) subscriber complained to the chief operator that the operators in the central office smoked cigarettes; she said that she could see the smoke issuing from her transmitter.—The Telephone News.

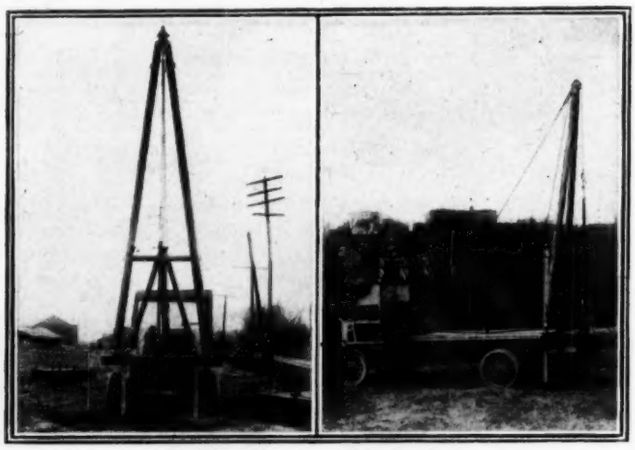
Never mind politics; the telephone business is good whether Taft, Teddy or Bryan wins.

The Automobile Truck in Telephone Construction Work

Use of the Motor Truck for Digging Post Holes and Placing Poles in Position—Test Made by Pennsylvania Company Shows Great Saving Effected by Utilizing Truck and Engine—Some Maintenance Figures of Automobiles and Motor Trucks.

By J. D. Holland

During the past few years the automobile has taken a prominent place in the equipment of telephone companies. Numerous applications have been found for it by the various departments. The construction gang makes extensive use of the motor truck in the setting of poles, as well as



Digging Pole Holes with the Motor Truck.

carrying all the construction tools and supplies to the place where they are to be used.

A recent use for the truck is that of digging post holes, in addition to aiding in setting the poles. The truck frequently used is of a three ton type. The platform of the rear of the truck is reinforced with a heavy "I" beam, which furnishes a rigid support for the boom or derrick. This boom supports the drilling apparatus, which consists of a modified carpenter's expansion drill driven by a chain gear arrangement, operated by the engine of the truck.

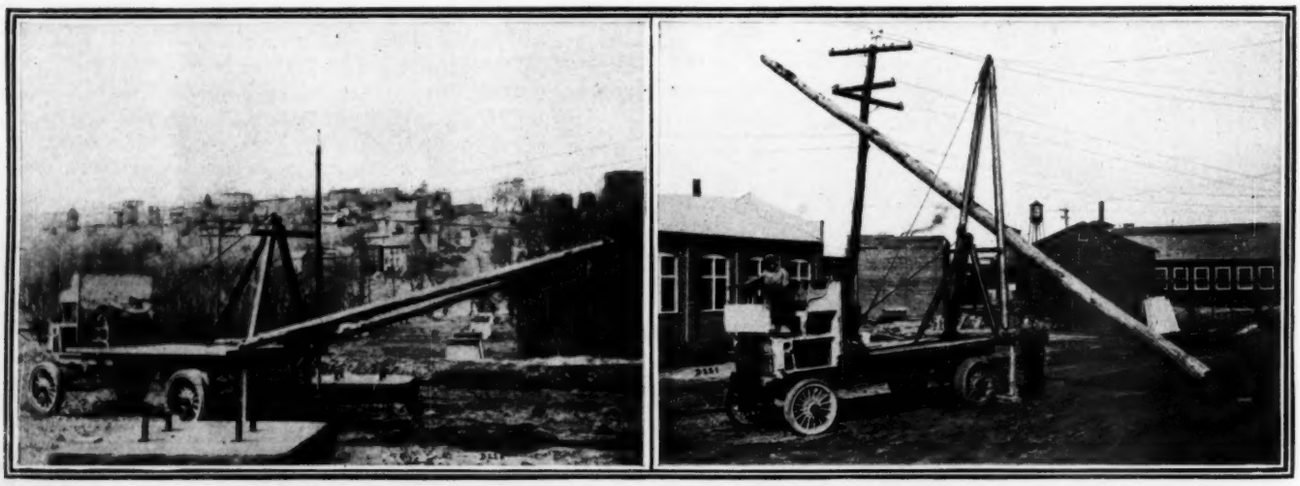
The drill is about a foot long, having a disc shaped plate with a tooth cutting edge which throws up the earth as the drill bores into it. The disc supports the core of the loose earth and at a signal to the driver of the truck, can be raised or drawn from the hole by means of a cable attached to a winch operated by the engine of the truck. The illustration shows quite clearly the method used for digging the holes.

After the post hole has been drilled and the earth removed, a chain is fastened about the pole to be set. In a very short time by means of the derrick, winch and engine, the pole is hoisted and placed in the hole as is shown in the illustration.

A report of the recent test made by the Bell Telephone Co., of Pennsylvania, at Glassboro, N. J., shows the possibilities of the motor truck for this kind of work. The truck equipped with a digger left the telephone company's offices in Philadelphia with a driver and operator for the drill at 7:10 in the morning and arrived at the scene of operation in Glassboro, a distance of 25 miles, at 8:45. The first hole was dug and the pole set in 27 minutes. A second hole was excavated and the pole set in 30 minutes.

The erection of a third pole occupied 45 minutes, and the fourth pole took the same time. The longer period for erecting the third and fourth poles was caused by the fact that the poles were placed in position under a lead of thirty wires. The poles were 35 ft. in height and were put in place without interfering with the wires so that the time was very good considering the difficulty. Two more poles were erected, the holes being dug and the poles set in position in 25 minutes for each pole.

The gang used for drilling the holes consisted of two men and an operator of the derrick and a total of five men were used to set the poles in position. Under the old method it would have required one man, one hour to dig the hole and a gang of nine men and a foreman to place the pole in position. This latter operation takes from 15 minutes to half an hour longer, so that to dig a hole and set the pole in place requires a total time of one hour and a half in addition to a larger force of men.



The Motor Truck Has Become a Time and Labor Saver in Placing Poles in Position.

The telephone company assumes that one man will dig about 10 pole holes a day and on that basis but 10 poles could be set up per day under ordinary conditions. With

the automobile truck and a post hole digger two holes can be dug and the poles placed in position in one hour, which would make a total of 20 poles per day. This is based on digging the holes 6 feet 6 inches in depth, each hole requiring six raisings of the drill to remove the dirt and make ready for the poles.

Statistics furnished by E. J. Speh of the telephone company, show that with the construction gang of nine men and a foreman, already on the ground, it would cost approximately $42 per day to place ten poles in position by the old method. The use of the motor truck, the company figures will cost, including the operating charges of the pole digger and the construction gang, about $18 per day. This amount is practically one-third the cost of the present method and the number of poles erected, is doubled.

The construction gang carries a portable telephone set which is used to report to headquarters from time to time as the gang moves along the country roads. The men are thus constantly in touch with headquarters, and available for any emergency which may arise.

Another use to which the motor truck is placed, is that of handling cable reels. With the truck, cable and reels are transported quickly from place to place as desired, saving a great amount of time over the horse drawn method of transporting cable. The truck is also used for drawing in the cable in conduits.

The International Motor Co., New York, has furnished a number of motor trucks to the Bell Telephone Co., of Pennsylvania and they have proven exceedingly satisfactory. The post hole digger, which is a recent development, is known as the Mack post hole digger and derrick. It has been thoroughly tested in various kinds of soil including clay and has successfuly demonstrated its digging capabilities. It is expected that it will find a large field of application in the future in telephone and electrical line construction.

A recent issue of The Telephone News contained some interesting figures showing the automobile maintenance statement for 1911 of the Bell Telephone Co., of Pennsylvania. It is divided into two parts, one showing the costs of light weight cars and the other table taking into consideration the motor trucks. The figures cover several different types and sizes of machines which were in service in widely separated districts and the results are calculated both on the hour and mile basis.

LIGHT CARS AUTOMOBILE MAINTENANCE STATEMENT.

Number	Division	Machine	Miles run	Oil and Gasoline	Repairs	Tires	Parts and Incidentals	Deprec., Ins. and Interest	Total Cost	Hours Out of Service. Hours in Service	Repairs	Weather	Other Causes	Cost per Hour in Service	Cost per Hour in Service Incl. Deprec.	Cost per Mile	Cost per Mile Incl. Deprec.
2	Phila.	3-pass. 30 h.p. runabout	16,765	$324.11	$894.09	$513.29	$366.39	$744.72	$2,842.60	2,757	382	229	2,180	$0.76	$1.03	$0.13	$0.17
3	Phila.	2-pass. 20 h.p. runabout	6,502	59.70	55.88	116.90	169.10	207.36	608.94	1,601	67	14	228	.25	.38	.06	.09
1	B'more	3-pass. 30 h.p. runabout	4,860	91.97	146.10	226.07	261.77	372.36	1,098.27	1,118	260	343	743	.65	.98	.15	.23
1	N. J.	3-pass. 30 h.p. runabout	8,524	128.56	51.66	153.19	83.12	372.36	788.89	1,184	373	255	908	.36	.67	.05	.09
1	N. J.	2-pass. 30 h.p. runabout	10,481	116.39	20.75	164.55	156.27	454.05	912.01	1,260	243	81	501	.36	.72	.04	.09
1	Pitts.	5-pass. 20 h.p. touring (French rating)	11,654	213.43	1,143.60	405.23	1,370.92*	472.23	3,593.01	1,484	657		154	2.10	2.42	.27	.31
1	Pitts.	7-pass. 40 h.p. touring	12,060	309.67	509.27	498.33	1,240.52*	825.00	3,368.39	1,863	387		249	1.36	1.80	.21	.38
1	Pitts.	2-pass. 20 h.p. runabout	860	20.89	36.69	106.19	79.86	72.07	315.70	268	180	65	63	.91	1.18	.29	.37

*Chauffeur's and garage man's wages included.

HEAVY CARS AUTOMOBILE MAINTENANCE STATEMENT.

Number	Division	Machine	Miles Run	Oil and Gasoline	Repairs	Tires	Parts and Incidentals	Wages	Depreciation and Interest	Total Cost	Hours Out of Service. Hours in Service	Repairs	Weather	Other Causes	Cost per Hour in Service	Cost per Hour in Service Incl. Deprec.	Cost per Mile	Cost per Mile Incl. Deprec.
1	Philadelphia	1½-ton truck	4,458	$93.55	$84.24	.....	$118.63	$431.38	$257.45	$985.25	1,216	34	..	..	$0.60	$0.81	$0.16	$0.22
1	Philadelphia*	3-ton truck	1,510	67.95	203.58	.....	413.80	214.57	256.23	1,156.13	499	200	..	..	1.80	2.31	.60	.77
1	Eastern	1½-ton truck	3,890	113.80	3.00	.....	62.05	333.34	257.45	769.64	1,086	18	48	18	.47	.71	.13	.20
2	New Jersey	1½-ton truck	10,279	306.15	27.33	$41.58	133.59	668.37	512.92	1,689.94	2,306	109	9	21	.51	.73	.11	.16
1	Baltimore	1½-ton truck	3,104	81.31	12.93	.....	109.12	258.00	257.45	718.81	1,212	72	..	10	.38	.59	.15	.23
4	Baltimore	1,000-lb truck	11,775	195.52	173.64	254.68	393.38	.....	460.80	1,418.02	3,717	667	85	184	.27	.38	.09	.12

*The major portion of the time this truck was used as a tool.

Plans for New Lincoln Exchange Perfected.

The Lincoln (Neb.) Telephone & Telegraph Co. has decided upon plans for its new exchange building at Lincoln. They will cost $100,000 to execute.

The old automatic building will be incorporated into the new structure, which is to be three stories in height. The building which has been used heretofore is two stories in height with a basement and has been considered one of the most modern in this section of the country. With the addition it is claimed by the directors that they will have one of the most modern plants in the country.

The first floor of the new building will be rented for commercial purposes, the company retaining the other floors for its offices and operating departments. The consolidation of the former Bell and the automatic system will probably not be pushed until the new structure is ready for occupancy. The long distance lines are already available to both Bell and automatic subscribers.

The new building will be ready for occupancy about January 1, next.

The contract for a new exchange building at Beatrice has also been disposed of. This building is to have a frontage of twenty-five feet with a depth of ninety feet. The cost will be approximately $20,000.

Local consolidation has been accomplished in twenty-eight of the towns located in the South Platte territory of the Lincoln company. At Tecumseh, it is said that business has almost doubled over that enjoyed by the two companies when operated singly.

Complain of Poor Service in Oklahoma Town.

The Oklahoma Corporation Commission has received a complaint from citizens of Madill in regard to poor service from the Pioneer Telephone Co., including delays and confusion in cross-talk. More up-to-date equipment is asked for.

From Factory and Salesroom

Convention: Western Pennsylvania Independent Telephone Association, Charleroi, July 18, 19

The Dudlo Company's New Factory for Enamel Wire.

The Dudlo Mfg. Co., Fort Wayne, Ind., has just completed its new factory for the manufacture of enamel insulated wire and coil windings of every description.

The new quarters have been designed with a view to turning out at the lowest possible cost, the very highest quality of enameled insulated wire and windings.

The knowledge gained from years of experience in the manufacture of enameled wire and insulating materials, has been employed in designing this factory and as a result it is believed to be one of the most perfect factories of its kind ever built.

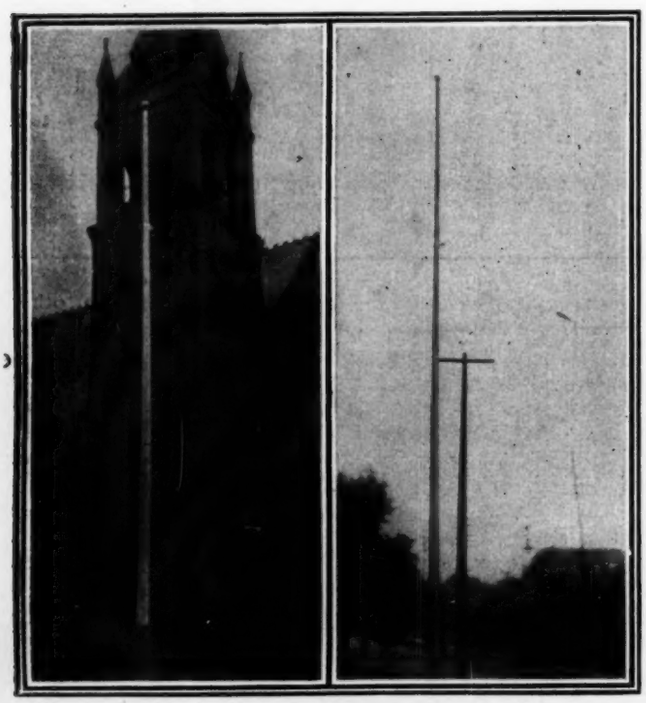
The new winding department has been equipped with every convenience for the rapid, economical handling of coil winding business. The business of the Dudlo Mfg. Co. is growing rapidly and with the new equipment it is in a position to take care of orders and inquiries in a prompt and careful manner.

One Product of The Duluth Log Company.

Telephone and telegraph poles are not the only product of cedar producing companies although they form a good percentage of the business. Occasionally flag poles are furnished under specifications which are much more difficult to comply with than those for the ordinary telephone poles.

The appearance of a flag pole counts for more than that of a telephone pole and the one shown in the illustration certainly is all that could be demanded in that respect.

The flag pole, which was recently dedicated by William Jennings Bryan, stands 66 feet above the ground line and towers far above the telephone and power poles in its immediate vicinity.



A Cedar Product of a Duluth Company.

This pole was furnished by the Duluth Log Co. of Duluth, Minn., which handles cedar products of all kinds.

Will M. Traer Will Go to Florida.

For many years, Will M. Traer has been a prominent figure in the telephone field, associated with Stanley Lichty as owner and manager of the Western Telephone Journal. They were very popular throughout the operating and manufacturing branches of the industry. Through their connection with the Cornbelt Telephone Co., they also were practical telephone men, while extensive patronage in the line of telephone directories, catalogs, booklets and job printing of all kinds brought them in close touch with the various interests of the telephone field almost constantly. Mr. Lichty removed to Florida, and now comes the word that Mr. Traer, who has continued the operations of the Telephone Journal Press is arranging to join Mr. Lichty in the near future.

Will M. Traer.

The plant and the business of the Telephone Journal Press has been sold to H. G. Kruse, publisher of the Benton County Times at Vinton, Iowa. Mr. Kruse will consolidate the two plants and retaining the name of the Telephone Journal Press will continue to print directories, loose leaf blank forms, and all kinds of telephone printing as heretofore.

Mr. Traer is understood to retain a financial interest in the business and will be connected with the plant in an advisory capacity for the next three or four months. After that he will remove to Florida and engage in the newspaper and land business with Mr. Lichty.

The many friends of these former telephone publishers will unite in wishing them success in their new location.

A New Grounding Device.

A device known as the "Maxum" grounding box has been designed to meet the most exacting requirements of electric light and telephone service. The construction embodies the salient features that have proven, from numerous tests, most effective in establishing an earth connection, at once efficient and permanent in character.

The "Maxum" grounding box consists of a hollow cylindrical cast iron shell, approximately five inches in diameter and twelve inches long. Supported by this shell, and forming part of the same casting, are a number of longi-

tudinal ribs that extend radially outward from the circumference of the cylindrical surface.

The center of the box serves as a receptacle for holding a special hygroscopic compound of silicates, sodium, carbon and vegetable fibre.

Connection to the ground box is made by means of a one-inch galvanized iron pipe which is screwed into the top of the casting and securely fastened to the body by means of a suitable clamping lug.

The entire construction is heavily galvanized by the hot-dip process and eliminates any possible corrosion due to electrolytic action or oxidization of the exposed parts.

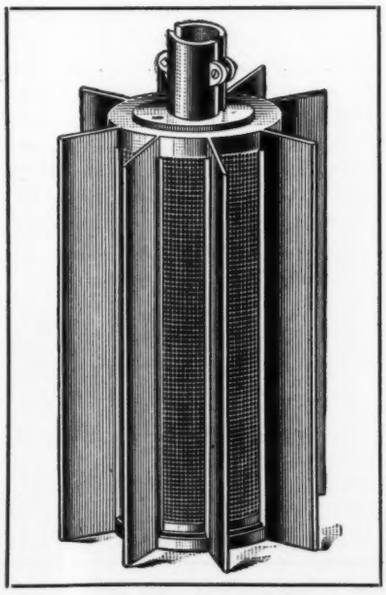
This particular design of grounding device provides a surface of over 500 square inches, so that the current density per unit area for any given discharge is reduced to a very small amount. This feature is of particular importance where continuous or recurrent charges of long duration are experienced.

In cases where the current density is high, due to too small an area of contact surface, the heating effect is sufficient to rapidly drive off the electrolytic moisture that supports conduction and render a ground inoperative.

Tests made upon the "Maxum" grounding box have shown a very high ampere-hour capacity even under heavy discharge rates, without any apparent increase in resistance due to local heating.

Another point that has been given particular attention in this device is the method of supplying electrolytic moisture to the earth immediately surrounding the ground connection. Practical tests have proven that in general all the resistance to current flow from an electrical conductor to the surrounding earth, lies within a few inches of the grounding device. Further, since the transfer of current is principally by means of electrolytic conduction, the efficiency of any ground connection will be dependent upon the chemicals existing in the earth in intimate contact with the ground electrode and also upon the amount of moisture present.

In the "Maxum" ground, the composition is exceedingly hygroscopic in nature and therefore not only tends to draw



The Maxum Ground Box.

and retain a considerable amount of moisture, but also to supply to the strata of earth surrounding the outer surface, those chemicals most needed to support electrolytic conduction.

The permanency of the ground connection has also been carefully considered in the construction of this particular grounding device. Care has been taken to provide a mechanically strong pipe connection and rigid grounding element. The material of which the box is composed is cast iron and the extra heavy coat of galvanizing precludes any danger from corrosion due to the electrolytic action of the discharge currents. Local action, invariably present where dissimilar metals are exposed to a common electrolyte, and producing rapid deterioration of the metal parts, is also effectually guarded against.

In installing a ground, care should be taken to select a moist soil if possible. Loamy soil is best fitted for this purpose; clay or gravel beds should in general be avoided.

The "Maxum" ground should be sunk to a depth of five or six feet, depending on the nature of the soil and the connecting pipe added so as to bring the end twelve inches or more above the grade level. After tamping the earth thoroughly into the hole, if convenient pour as much water as possible into and around the pipe so as to thoroughly saturate the composition held in the ground box.

Connection between the circuit or piece of apparatus to be grounded, and the ground pipe should be made preferably by means of an approved ground clamp.

In practice it has been found that several hours usually elapse before the ground shows an appreciable discharge capacity, and under certain condition does not reach a maximum value for several days after installation. This latter condition exists where the soil is particularly dry and no water is poured around the ground.

It is recommended that wherever possible, accurate records be kept of the resistance and ampere-hour capacity of the ground connection, so that any change in condition due to external sources may be detected and corrected. This procedure is, of course, hardly practicable on line grounds, but for station work is highly desirable.

In large installations of electrical apparatus, where it is desirable to install a particularly heavy ground connection, it has been found best to install several ground boxes about five feet or more apart and connected together by a common grounding bus.

Th "Maxum" ground box has been placed on the market by the Fairmount Electric & Manufacturing Co., Philadelphia, Pa.

Book Reviews.

THE ELECTRICAL BLUE BOOK. Compiled and published by the Electrical Review Publishing Co., Chicago. 206 pages, with numerous illustrations. Price $2.

The 1912 Electrical Blue Book is a handsome publication containing a comprehensive exhibit of officially approved electrical supplies, to which is added an illustrated list of other representative lines of electrical material. A feature which makes this book especially valuable to every user of electrical material is the National Electrical Code, the rules and requirements of the National Board of Fire Underwriters for electrical wiring and apparatus as recommended by the National Fire Protection Association.

The code rules are explained in detail and the many illustrations bring out in a most understandable manner, the correct interpretation of the installation rules. A complete index makes each rule and section easily discovered. The list of approved fittings is unusually comprehensive and is brought up to May 1, 1912.

The illustrated exhibits of the manufacturers of electrical material, together with the other essentially valuable contents of this publication, make it of unique value to the buyer of electrical apparatus and supplies. The book measures 9 by 12 inches, is bound in substantial stiff cloth covers.

MODERN ILLUMINATION, THEORY AND PRACTICE. By Henry C. Horstmann and Victor H. Tousley. Frederick J. Drake &

Co., Chicago, publishers. 275 pages with diagrams and tables. Price, $2.

This book, which is of convenient pocket size, is intended as a handbook of practical information on illumination for the users of electric light, architects, contractors and electricians. The first few chapters take up the theory of illumination and methods of calculation. The characteristics and specific uses of the various electric illuminants, including all forms of the arc lamps, incandescent lamp and other illuminating sources such as the Moore tube, Nernst lamp, mercury vapor lamp, etc., are fully described. The various types of shades and reflecting material are discussed and the principles regarding the placing of lamps to obtain the best results are set forth.

Directions are given regarding the drawing of plans and specifications. Rules, formulae and tables for reference in working out problems encountered in daily work are presented. Anyone at all interested in illumination may become well informed on the subject through a careful study of the book.

Swedish-American Telephone Company's Plant Sold.

W. H. Johnson, a lawyer, with offices at 129 N. Wabash avenue, Chicago, on Thursday, bought the buildings, real estate, patents, dies, jigs, good will, mailing list and unfilled orders of the Swedish-American Telephone Co., of Chicago. The orders now on hand unfilled aggregate approximately $21,000. The price paid was $5,100, the purchaser also assuming the mortgage upon the property, amounting to $16,000.

Various lots of the stock on hand were bought at the sale by Ed. Stoeffhaus, of the Rebuilt Telephone Equipment Co.; O. C. Dennis, of the Premier Electric Co.; Mayo Lenz, of Runzel-Lenz Electric Mfg. Co., and P. C. Burns, of the American Electric Telephone Co., all of Chicago.

Mr. Johnson was unable to formulate his plans sufficiently to announce them in this issue of TELEPHONY. A definite statement from him may be expected soon.

THE INTERNATIONAL GRADOLPH ELECTRIC CO., owner of the Gradolph patents for long distance transmission of speech and power, has moved from 800 Chestnut Street to 913 Chemical Building, St. Louis.

A Time Saving Portable Test Set.

A portable test set which will give an indication to the troubleman of his nearness to the trouble is a novelty and one which should be welcome addition to his outfit for locating trouble.

A test set which is being marketed by Stewart Bros. of Ottawa, Ill., contains many new and novel features. It is of a convenient size and is light in weight, yet it has all the essential parts necessary for a lineman's test set. It is said that it is unnecessary to speak directly into the transmitter to secure good transmission and that the set may be held in the position shown in the illustration and yet be heard distinctly at the office.

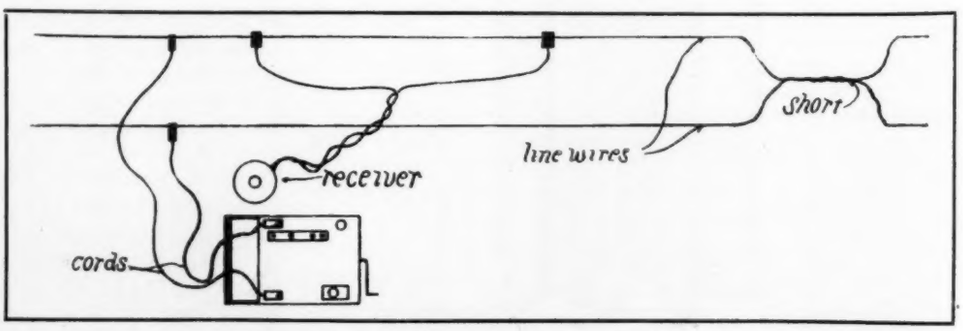


Diagram of Connections of the Stewart Test Set.

The set is a telephone and traveling test board as it is carried by the lineman. It will tell which way to go to get to the trouble from any point on the line without cutting a wire. It also tells, as near as line conditions will allow, how far the trouble lies from the tester. The troubleman can tell when he is getting close to his trouble and should he pass it, he will discover it at the first test made beyond the trouble. He will be able to tell down which part of the line the trouble lies, without cutting the wires.

Tests can be made from the office if desired. The nature of the trouble on the line may be discovered and its distance from the office found approximately. Time and livery expense can

Using the Stewart Test Set.

be saved by its use. It is constructed so that any one can operate it.

The test set should prove a valuable asset to large toll operating companies as it shortens the trouble period of the lines affected. Full particulars may be obtained from Stewart Bros., Ottawa, Ill.

Paragraphs.

WILLIAM H. MARSH, for the past ten years connected with the Standard Underground Cable Co., of Pittsburgh, Pa., in the capacity of superintendent of construction, has been appointed secretary, assistant treasurer and sales manager of the Standard Underground Cable Co., of Canada, Ltd., with headquarters at Hamilton, Ont.

H. G. BURD, who for some time has been connected with the Standard Underground Cable Co., as sales engineer in the New York office, has been appointed assistant to the sales manager of the Standard Underground Cable Co., of Canada, Ltd., with headquarters at Hamilton, Ont.

THE MONARCH TELEPHONE MFG. CO., of Fort Dodge, Iowa, has just issued a pamphlet which will be of interest to its customers and all operating exchanges. This pamphlet is No. 23, and bears the title "The Monarch Factory." It contains illustrations of the various departments in the splendidly equipped manufacturing plant located in Fort Dodge, Ia. It shows the facilities which have enabled the Monarch company to take care of the exceedingly large volume of business secured during the spring. A careful reading of the pamphlet and a study of the illustrations indicates that the Monarch factory in Fort Dodge is in splendid shape to continue the growth and progress which this company has always made.

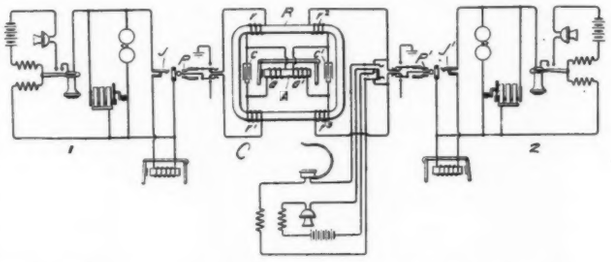
From the Patent Office

By Max W. Zabel

Connecting Circuit for Magneto System.

E. H. Colpitts, East Orange, N. J., 1,029,593, June 18, 1912, assigned to Western Electric Co., New York, N. Y.

A cord circuit for magneto exchanges is described in which one drop answers for the two connected lines, but in which provision is made to eliminate through ringing to the other subscriber's telephone when the first subscriber rings off. The coils r^2 and r^3 practically constitute



one winding of a repeating coil and coils r and r' constitute the other winding of a repeating coil, a and a' are the drop coils. The inductive relation between the drop windings a, a' is opposite to that between the repeating coil windings r, r' considered as one and r^2, r^3 considered as the other.

This is indicated in the drawing by showing the windings a, a' of the drop A wound in opposite directions upon their common core and the repeating coil windings arranged as usual.

Pay Station.

G. A. Long, Hartford, Conn., 1,028,945, June 11, 1912; assigned to Gray Telephone Pay Station Co., Hartford.

This telephone pay station is of the type in which the signal to the central operator is received through the agency of sound waves from the operating signal acting upon the transmitter. It has a non-resonant connection between the signal and the transmitter, so that the sound waves of the signal do not travel through the mechanism of the box, but act on the transmitter through the air only.

Adjustable Receiver Support.

H. G. Schwager, Omaha, Nebr., 1,029,640, June 18, 1912.

An adjustable support for a telephone receiver for attachment to a desk stand is shown, which when in its position of non-use controls the normal switchhook lever.

Telephone Holder.

M. Milewski, Carmel, N. Y., 1,029,390, June 11, 1912.

An arm adapted to be mounted on a wall for supporting a desk telephone is described in this patent.

Telephone Repeater.

F. J. Shubert, Portland, Ore., 1,029,724, June 18, 1912.

A repeater is described to overcome singing or howling when used alternately in opposite directions. It employes at the repeating station, a pair of artificial lines, each having approximately the same electrical characteristics as the corresponding section of the telephone line. These artificial lines are so associated with the circuits and apparatus of the repeater system that incoming currents over one of the line sections will have complete inductive association with the electromagnetic element of the corresponding relay. With this connection the relayed currents from the transmitting element of one of the telephone relays will pass out over the proper line section and the corresponding artificial line in such way as to affect inductive neutrality with respect to the receiving element of the relay corresponding to that line section.

Telephone Directory.

A. O. Johnson, Liberty, Mo., and J. A. Eby, Excelsior Springs, Mo., 1,028,117, June 4, 1912.

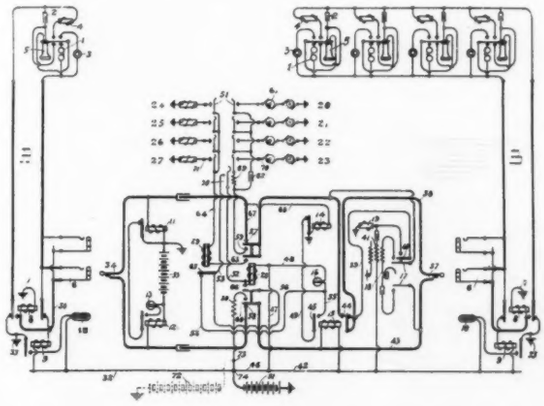
A device is set forth in this patent which is provided with take up and storage rolls for holding paper for the purpose of making notations, the device being arranged for attachment to a telephone.

Automatic Ringing System.

A. H. Weiss, Wilmette, Ill., 1,029,649, 1,030,037, 1,030,038, 1,030,039, June 18, 1912; assigned to Kellogg Switchboard & Supply Co., Chicago.

The first invention relates to an automatic ringing system in which the subscriber's bell operates until the response of the called subscriber. The ringing generators 21, 22 and 23 are under the control of a control relay 28. Whenever the ringing key is operated, this control relay closes the circuit of one of the generators with the called line upon response of the called subscriber. When the called subscriber responds a circuit is established from battery 31, conductors 46 and 42, supervisory relay 15, sleeve strand 43, sleeve contacts of plug and jack, the telephone line, tip contacts of jack and plug, tip strand 38, contact 63, winding of disconnect relay 29, conductor 64, ringing key contacts to ground through impedance coil 24. This energizes relay 29 to open the locking circuit of the controlled relay 28 to permit its contact springs to drop back. Relay 29 is slow acting.

The second patent is similar except that two sources of current, direct current and ringing current, are alternately



associated with the line. The response of the subscriber de-energizes the controlled relay irrespective of which source is at that moment associated with the line.

In the third patent, the controlled relay operates a separate relay which controls the ringing generators. This second relay also controls the circuit of the supervisory relay. The locked circuit of the controlled relay also is controlled by the armature of the supervisory relay.

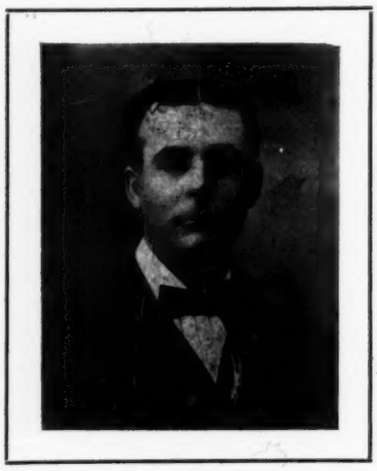
The last patent describes a similar system except that a differential relay is used selectively responsive to the connecting of the cord circuit with the line jack. The operation of the ringing key unbalances the differential relay to attract its armature to thereby connect the ringing current to the line.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

W. P. HEMPHILL, for years general manager of the Topeka Independent Telephone Co., will shortly sever his connection with the company to take the management of the proposed Southwestern Blaugas Co., with headquarters in Kansas City, Mo. Mr. Hemphill is now in New York City purchasing machinery for the new plant. When he returns to Topeka he will turn over his duties to the different department managers of the Bell company. Mr. Hemphill will then go to the lakes in Minnesota in the vicinity of St. Paul, for the summer where he will be able to make a study of the Blaugas factory in St. Paul. He will return to Kansas City in September, and expects to have between 200 and 300 workmen employed in the factory by the first of the year.



W. P. Hemphill.

The management of the Topeka exchange will be conducted by departments. A. J. Mackey will be the local manager and William Norttorf, formerly wire chief of the Independent company, will be district plant superintendent of the consolidated exchange. H. E. Gwillam will act as traffic superintendent, and Edward Kellam will be district manager of district number ten, in which the Topeka exchange is located.

Mr. Hemphill's many friends in the telephone business will regret to learn of his leaving it. But they will, of course, as does TELEPHONY, wish him success in the new venture.

V. E. CRAIN, manager for the Douglas Telephone Co. at Homer, Ill., has been transferred from that office to Assumption.

J. L. BUSHNELL, president of the Home Telephone Co., of Springfield, Ohio, has become a member of the Rejuvenated Sons of Jove.

CLARK OGDEN, New Vienna, Ohio, manager of the Clinton Telephone Co., was married recently to Miss Mary Dumenil, of Hillsboro.

J. A. HEBERT, formerly manager of the Cumberland Telephone & Telegraph Co.'s exchanges in Spencer county, Indiana, has been transferred to Evansville as plant supervisor for the Evansville district under A. L. Joynes, district plant superintendent.

SAMUEL J. JONES, formerly manager of the Nephi district of the Mountain States Telephone & Telegraph Co. has been made manager of the Ogden, Utah, office. W. F. Madison, whom he succeeds, will remain in Ogden and will act as personal representative of C. G. Seelye, general manager of the western division.

M. A. SANDERS, for three years manager of the Pioneer Telephone Co., at Tulsa, Okla., has been made division superintendent. His territory will be the southeastern portion of the states. C. J. Castleberry, manager at Bartlesville, will succeed Mr. Sanders.

FRED R. MOTT, until recently general manager of the Bell Telephone Co., of Missouri, has opened offices in the Chemical Building, St. Louis, as consulting engineer. He recently gave expert testimony before the Railroad Commission in the Montreal rate case.

FRED B. BUTT, who was manager at Nebraska City, Neb., up to the time that the Nebraska Telephone Co. was taken over by the Lincoln Telephone & Telegraph Co., has been appointed chief clerk and claim agent for the Nebraska company for western Nebraska, with headquarters at Grand Island.

Obituary.

GEORGE A. LYON, general manager of the Live Oak Telephone Co., Live Oak, Fla., died on June 10. Mr. Lyon was a pioneer Independent telephone man and will be greatly missed by his friends and associates.

WILLIAM E. ATHEARN, superintendent of equipment of the American Telegraph & Telephone Co., of New York City, died recently at his home in Brooklyn, N. Y., from an attack of pneumonia and heart trouble induced by overwork.

THOMAS HOWARD WATSON, assistant deputy paymaster for the New York Telephone Co., in Brooklyn, N. Y., died a short time ago, following an operation for intestinal trouble. Mr. Watson was born in New York City, forty-two years ago.

J. M. C. Gillespie, treasurer of the Universal Cable Grip Co., Syracuse, N. Y., died recently as the result of a motorcycle accident. For many years Mr. Gillespie was in charge of the cable department of the Bell Telephone Construction Co., with headquarters in Syracuse.

CHARLES H. ADAMS, state superintendent of the New England Telephone & Telegraph Co. for seven years, until he suffered a paralytic shock, four years ago, died recently at Limerick, Maine, at the age of sixty years. He had served in both branches of the legislature, was county treasurer four years and was for a long time one of the most prominent Republican leaders in the First Congressional district.

New Companies.

GAZELLE, CAL.—A co-operative telephone company has been organized by the farmers between Gazelle and Callahan. The following are the officers: President: Charles Pitts; vice-president, R. V. Hayden; secretary, James Masterson; treasurer, C. G. Stricklin.

SAN MIGUEL, CAL.—The San Miguel Interurban Telephone Co., with $5,000 capital, has been incorporated by T. H. Rougeot, W. M. Sitton, W. A. Millmar, of San Miguel; and H. H. Durham and L. F. Van Horn, of Parkfield.

AUBURN, GA.—The Auburn Telephone Co. has been organized to establish a local system. The officers are: W. H. Carroll, president; and B. O. Cosby, secretary and treasurer.

REXVILLE, IND.—The Farmers Mutual Telephone Co. has been organized here, with a capital stock of $5,000. The incorporators include Jesse M. Lewis, Holton, R. D. 3; George H. Delay, Holton, R. D. 3; James H. Craig, Versailles, R. D. 3; and Murray Jackson, Madison, R. D. 9.

DALTON, KY.—The Dalton Telephone Co., capitalized

at $1,000, has been incorporated by F. C. Sisk, L. B. Sisk, B. G. Brown, G. B. Hale, B. D. Brown and S. D. Wilson, all of Dalton.

SPRING VALE, MINN.—The Walbo Rural Telephone Co. has been organized here, with $9,990 capital. The incorporators are A. Saterlund, Gust A. Larson, S. O. Wicklund, John W. Gradin, president, and others.

RULEVILLE, MISS.—The Burl Telephone Co., capitalized at $5,000, has been incorporated by J. M. Riddell, J. M. Jones and T. B. Brown.

RICHVILLE, N. Y.—The Richville Telephone Co. has been incorporated, with a capital stock of $9,000. The directors for the first year are:

Griff D. Davis, Henry Gray, George Stiles, Adebert A. Gates, A. Fred Shooner, Elmer E. Seavey, Frank B. Beaman, and Frank Bristol, of Richville; Manley E. Johnson, William Haile, Ford A. Smith, of Bigelow; Chas. E. Small and Oratio N. Ritchie, of Governeur; B. Frank Keyer, of De Kalb Junction, and Horace Hurlbut, of De Kalb. The company is to operate in St. Lawrence county.

STRINGTOWN, OKLA.—The Citizens Telephone Co., capitalized at $2,000, has been incorporated by O. A. Moody, M. R. Winters and O. C. Elkins.

BROADWAY, VA.—The Maryland Switchboard Co., capitalized at $3,000, has been formed here. The officers are: J. M. Lohr, president; I. N. Higler, secretary. These two and H. H. Phillips, C. F. Sitzer and C. W. Turner, constitute the board of directors.

Construction.

FORDYCE, ARK.—The Home Telephone Co. will shortly move to new quarters and expects to install new common battery equipment. The building to which it will transfer the exchange will be remodeled.

CANTON, ILL.—The Canton Home Telephone Co. will build an office building on North Main street this summer.

DECATUR, ILL.—The Decatur Home Telephone Co. will spend approximately $20,000 within the next three months in new lines, a new exchange building at Mt. Zion, and the reconstruction of the plant at Dalton City. About 150 miles of No. 10 copper wire will be strung, and some 1,500 poles employed.

OWOSSO, MICH.—The Union Telephone Co. has decided to erect a $10,000 office building in this city.

ALEXANDRIA, TENN.—The Alexandria Home Telephone Co. has voted to install a new switchboard accommodating 500 subscribers. Additional trunk lines will be built to Liberty and Watertown.

Elections.

WOODHULL, ILL.—The Woodhull Telephone Co. held its annual meeting recently, when officers and directors for the year were elected as follows: President, W. P. Kirkland; vice-president, H. F. Simmons; secretary, F. G. Tapper; treasurer, A. A. Mackey; J. L. Woods, P. E. Taylor, F. J. Kellogg, W. G. Larson and E. N. Stephenson.

ELDORA, IOWA.—At the annual meeting of the Eldora Mutual Telephone Co. the following officers were elected President, Thomas Larson; vice-president, C. A. Reaver; secretary, Helen Hall; treasurer, W. E. Rathbone.

NEW BEDFORD, MASS.—The directors of the Automatic Telephone Co. have elected Frederic Taber president, of the corporation. Francis T. Akin, who has served as president for several years, declined re-election.

WALKERS ISLAND, IOWA.—The Walker's Island Telephone Co. has elected H. W. Meeker president; Guy Manning, secretary; Bert Karst, treasurer.

ISLAND VIEW, MICH.—The Readmond Township Telephone Co. held its annual meeting recently. The officers elected were: President, Levi Aler; vice-president and treasurer, David Gibson; secretary, E. H. Mathews.

SLEEPY EYE, MINN.—At the annual meeting of the Sleepy Eye Telephone Co., the following officers and directors were re-elected: President, C. P. Cutting; vice-president, Otto Friton; secretary, Wm. Brust; treasurer, F. J. Riedl; W. W. Smith, C. C. Hansen, C. P. Black, Andrew Losleben, Henry Dohrman.

SALEM, OHIO.—Stockholders of the Columbiana County Telephone Co. held the annual meeting recently and elected the following officers: President, Frank Davis, of Columbus; vice-president, W. C. Morrow, of Lisbon; treasurer, H. B. Taylor, of Columbus; secretary, W. L. Carey, of Columbus; directors, G. R. Johnson, B. H. Brooks and W. L. Carey, of Columbus.

BETHPAGE, TENN.—The stockholders of the Bethpage exchange of the Summer County Home Telephone Co. have elected the following officers: Thos. L. Moncrief, president; John W. Morgan, vice-president; George W. Chipman, treasurer; Arthur C. Earls, secretary; Thos. L. Moss, business manager.

RIDGEFIELD, WASH.—At the annual meeting of the stockholders of the Ridgefield, Sara, Vancouver Farmers' Union Telephone Co., held at Sara, the following officers were elected for the coming year: President, J. W. Blackburn; vice-president, D G. Converse; secretary, F. E. G. Royle; treasurer, A. C. Allan; directors, A. L. Swager, D. G. Converse, George Krebier, G. W. Baker and N. S. Allen.

Franchises.

MOLINE, ILL.—The city commissioner has called a special election for July 23, when propositions to grant franchises to the Central Union Telephone Co. and the Tri-City Automatic Home Telephone Co. will be voted upon.

QUINCY, ILL.—The judiciary committee of the Adams county board of supervisors has submitted a report in favor of allowing the Mound Prairie Telephone Co. to use the highways of Beverly township for its lines.

BUTTE, NEB.—The Boyd County Mutual Telephone Co. has obtained a franchise in the village of Butte.

COLVILLE, WASH.—A franchise has been granted to the Deer Creek Telephone Co. operating out of Springvale and Valley, to construct a line through Camas prairie.

Financial.

FORT DODGE, IOWA.—The Fort Dodge Telephone Co. has increased its capital stock from $100,000 to $300,000.

RICEVILLE, IOWA.—The Farmers Telephone Co. has increased its capital stock from $9,000 to $25,000 for the purpose of taking over the Riceville exchange and of connecting with the lines of the Le Roy company.

MINNEAPOLIS, KANS.—The Rural Telephone Association will increase its capital stock from $6,000 to $28,000.

AUGUSTA, MAINE.—The Northern Maine Telegraph & Telephone Co. has increased its capital from $10,000 to $20,000.

BARNSTEAD, N. H.—The Union Telephone Co. has increased its capital stock $1,000 and will extend its lines.

IRONTON, OHIO.—The Ironton Home Telephone Co. has increased its capital stock from $50,000 to $100,000.

Miscellaneous.

CANTON, ILL.—The Central Union Telephone Co. is completing plans for remodeling its local system which will include the placing of wires underground in a considerable section of the city.

ELGIN, ILL.—Both telephone companies here, the Inter-State Independent and the Chicago Bell, have been ordered to bury their wires on Spring street from Milwaukee street to Grant avenue.

MONROE, LA.—The plant of the Home Telephone Company, which has 650 telephones in use has been sold to the Cumberland Telephone & Telegraph Co.

In the Rural Line Districts

Johnny Young is the new manager of the Mutual Telephone Co., of Hopkins, and has already moved here and begun work.—Hopkins (Mo.) Journal.

The local telephone system is being given a thorough overhauling, and when the work is completed will be much appreciated by all the patrons.—Carson City (Mich.) Gazette.

Friday the first local phone was put in the Moroni Co-op. They will be very busy from now on putting phones in. They have the wires strung on the poles. It will not be long till it will be in running order. There are to be about sixty phones to begin with.—Moroni Correspondence Mt. Pleasant (Utah) Pyramid.

The Tina Mutual Telephone Company intend to install a new 200 drop switch board at the telephone exchange office in the residence of Mrs. Markwell in the near future. —Tina Item Carrollton (Mo.) Democrat.

Wayne A. Kline, president of the Vera Cruz Telephone Co., is busy with his men stringing wires and getting things in shape generally. There is progress all along the line and prospects are bright for continued increase in business.—Vera Cruz Item Allentown (Pa.) Call.

A few of our farmers have been very busy this week setting up the telephone poles for the new line. They are anxious to get it into working order and give it a trial. After they find its real worth they will never regret the trouble taken to get it started.—Grant Correspondence Marion (Wis.) Advertiser.

The telephone meeting Saturday was fairly well attended, owing to the busy time with the farmers.—Kellerville Item Clayton (Ill.) Enterprise.

The Independent telephone company is receiving cables, poles and other paraphernalia for the rebuilding of the system to be done here this summer. The work has already been commenced as the poles are being shaved and painted. The new board will be shipped from Chicago and the story they tell about what the company is going to do "listens good."—Mt. Carroll (Ill.) Democrat.

HELP!
LONG DISTA
LONG DISTANCE
OH-SAY!-ER WAIT A MINUTE, COME BACK HERE, ITS ALL RIGHT, YOU CAN DO THAT AGAIN IF YOU WISH.
OH HEAVENS! I THOUGHT IT WAS CHARLIE
Brandenburg.

Saturday one of the younger members of the High School ball team that went to Lyons did not return with the team but stayed over to visit relatives. On account of rain he had to come home Sunday night in a roundabout way. While waiting for a Santa Fe train No. 8 he went to a telephone office at a certain town to talk home. He gave in the call and was standing looking out of the window into the darkness when he heard a light step behind him and two soft arms were thrown about his neck. He didn't faint, but all the stories of strange adventures in large cities raced through his mind. He thought of the sixty-nine cents in his pocket, sixty of which was required for car fare and made a grab for that. He finally managed to make some exclamation when there was a little shriek of surprise. He was released and looked around. Nothing was to be seen, but he heard a swish of skirts as a person disappeared through a door-way. No explanations were made, but it seems the night operator had come in, and evidently it was a case of mistaken identity. If not, and all customers are not treated in the same manner here is a case of undue preference and should be subject to investigation by the utilities commission.—Nickerson, Kans., Argosy.

C. O. BAKER, President C. W. BAKER, Vice-Pres.

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Foil, Sheets, Wire, Rivets and Contacts

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No. 19 Telephone Wire. Plain rubber. Single. Shows Belden quality.

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No. 19 Interior Telephone Wire. Rubber and dry braid, paired.

No. 18 Telephone Drop Wire. Rubber and weatherproof braid. Raised thread tracer. Strong and absolutely dependable.

All of these wires are bargains with Belden quality.

You should have our sample card showing 3-in. samples of a dozen representative Belden telephone wires.

Sent free only to those in the telephone business.

BELDEN MFG. CO.

2302 So. Western Ave.

CHICAGO

SIGN

DECLARATION OF INDEPENDENCE

Freedom Forever From Cord Troubles Obtained by Using R-L Cords

Whereas—In the quest for greater profits it has become necessary to eliminate all sources of useless expense and give particular attention to cord troubles;

Therefore—Be it resolved that Runzel-Lenz cords, which are proof against wear and water, always should be used exclusively, in order that operators may not injure them and subscribers may not complain of the service, while stockholders in turn will not be needlessly robbed.

Furthermore—The Runzel-Lenz Electric Mfg. Co., the only makers of telephone cords exclusively, having manifested absolute confidence in the superiority of their cords, by offering samples free for a trial as well as by a sweeping guarantee;

Therefore—In conclusion, be it resolved that we send this day for some Runzel-Lenz cords for tests and abide by the result which these tests may yield.

Given over our hand and seal for the benefit of our company and its patrons (see signature below).

Runzel-Lenz Electric Mfg. Co.
1751 N. Western Ave.
CHICAGO
Pacific Coast Agents:
Manny-Myers Co.,
Seattle, Wash.

Runzel-Lenz Electric Mfg. Co.,
1751 No. Western Ave., Chicago

Send us **desk set** / **receiver** / **transmitter** cords free for trial.

Company _____

Address _____

Name _____

C. R. CANFIELD
DRUGGIST
311 MAIN STREET

Ashtabula, Ohio, June 6, 1912. **190**

S. R. Newberry, Gen. Mgr.,
The Ashtabula Telephone Company.
Ashtabula, Ohio.

Dear Sir:

In our business we are aprticularly appreciative of prompt, reliable, and accurate telephone service, and want to commend your company and employees for affording us that class of service.

We cannot help but note a vast improvement along these lines since you put in the new switch board, and if the improved conditions are due to that fact, we are glad that you made the change to the Automanual.

Be this as it may, our patrons as well as ourselves have learned to rely on the telephone because of its absolute secrecy and unfailing promptness and reliability.

Sincerely, C R Canfield

Automanual wherever installed is preferred to all other systems. Subscribers appreciate the *absolute secrecy, promptness and reliability.* Co-operation of this sort results in a successful exchange. It is to your advantage to investigate the merits of Automanual.

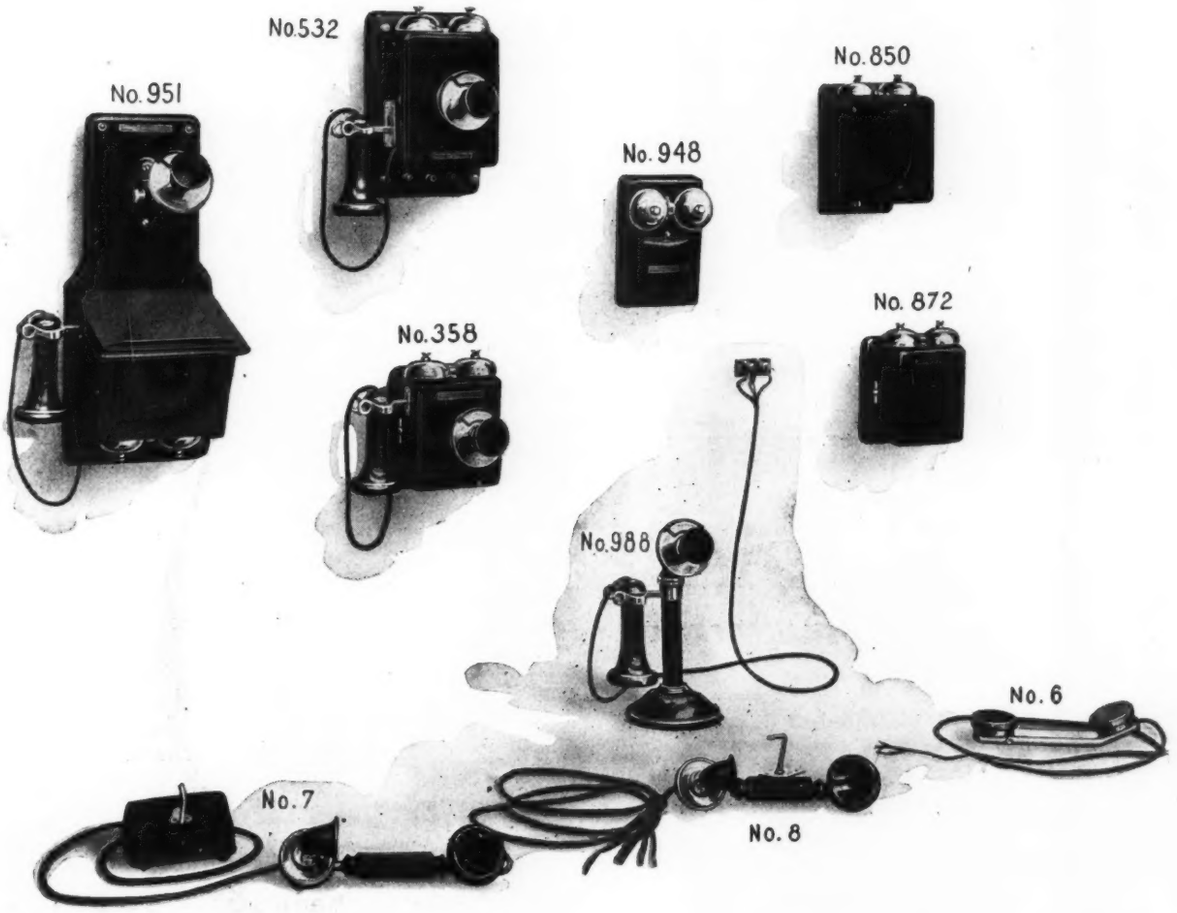
AUTO = MANUAL

The North Electric Company
Cleveland, Ohio

AUTO = MANUAL

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Standard Common Battery Telephones

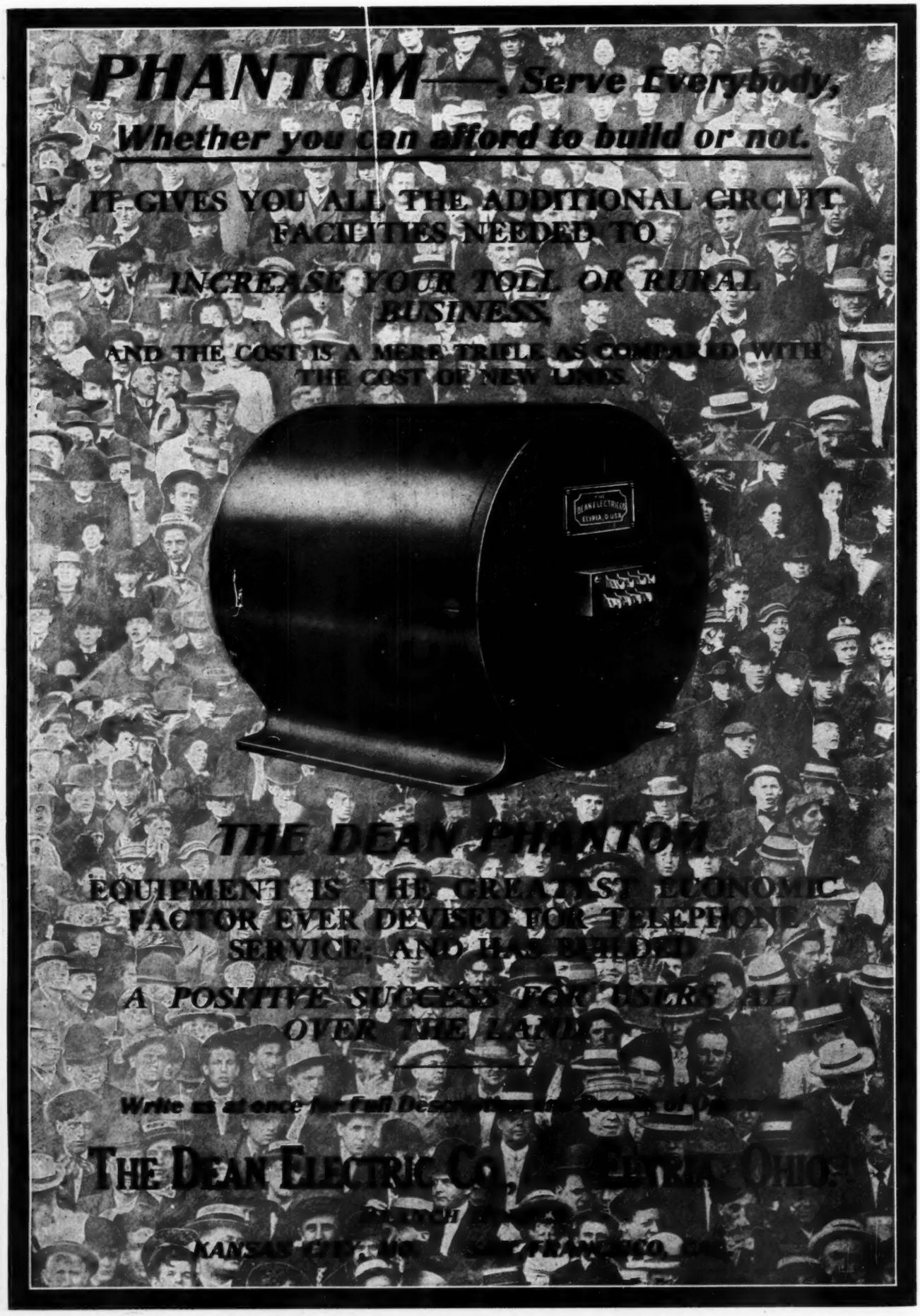


You should be familiar with the things that make our telephones excel. Superior designs and better quality than any other makes are winning features characteristic of all our equipments. The reputation our Common Battery Telephones have for service and our many users is conclusive proof that we do make the most dependable apparatus on the market to-day. The largest, most successful and the greatest number of Independent telephone plants use our telephones exclusively. We can furnish these standard types for any kind of service. This is the most complete and practical line of advance design instruments you can make your selections from. Back of every purchase is the Company with the facilities to serve you accommodatingly and efficiently. Demand samples to test in your own way and when you are ready prices will be quoted.

Stromberg-Carlson Telephone Mfg. Co.

Rochester, New York, U. S. A.

Chicago, Ill. **Toronto, Can.** **Kansas City, Mo.**
Los Angeles, Cal. **San Francisco, Cal.** **Seattle, Wash**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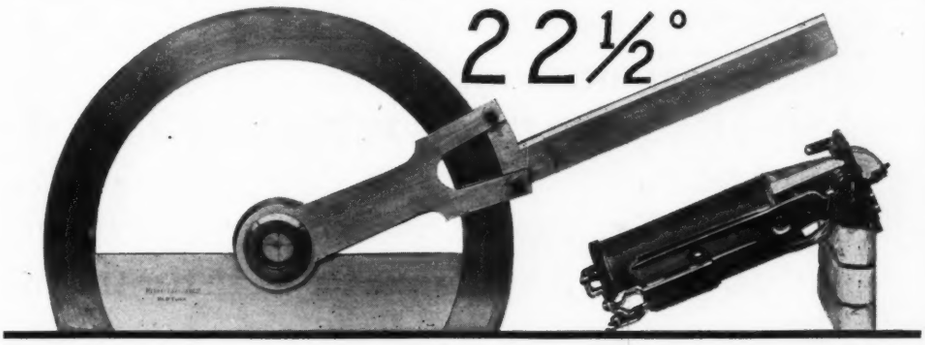
Whether you can afford to build or not.
IT GIVES YOU ALL THE ADDITIONAL CIRCUIT FACILITIES NEEDED TO
INCREASE YOUR TOLL OR RURAL BUSINESS
AND THE COST IS A MERE TRIFLE AS COMPARED WITH THE COST OF NEW LINES
THE DEAN ELECTRIC CO. ELYRIA, O. U.S.A.
THE DEAN PHANTOM
EQUIPMENT IS THE GREATEST ECONOMIC FACTOR EVER DEVISED FOR TELEPHONE SERVICE; AND HAS PROVED
A POSITIVE SUCCESS FOR USERS ALL OVER THE LAND.
Write us at once for Full Descriptive
THE DEAN ELECTRIC CO.
KANSAS CITY, MO.

The No. 11 Drop is the Most Sensitive



Unusual and Positive Fact Sensitiveness

The shutter is made to have a greater inertia, resulting in a slow start when released by the armature trip and insuring extreme sensitiveness owing to there being no friction other than at the starting point, for the armature raises free from the shutter at a greater speed than the shutter can fall forward. A guard is provided for the shutter trip rod, which, when struck by the trip rod, throws the shutter outward. This guard also, owing to its relation to the trip rod, prevents the armature from freezing to the pole piece. By energizing the drop you can operate the shutter up to the extreme position of 22½ degrees from the horizontal, a feature no other drop can perform.

In a brief summary we give you the particular reasons for No. 11 Drop sensitiveness: Armature of soft iron well annealed. Core of soft iron thoroughly annealed. Heel of soft iron properly annealed. Shell of drawn Norway iron properly annealed. Shutter starts slowly, reducing friction to trip contact. Armature not supported by pivot screws, as it is held by round bearing surfaces. Armature supported on bearing surfaces and not bound between heel iron and shell of pivot screws. Contact point between heel iron and shell of drop ground together. Winding space upon core very large, permitting maximum turns and size of wire for a given resistance. Shell not used for support of any operating elements, therefore cannot be thrown out of adjustment. Core and shell perfectly faced at armature and securing an extreme sensitiveness. *Illustrating the extreme sensitiveness of the No. 11 drop, our standard shop adjustment for a standard 350 ohm drop will be through 10,000 ohms. And, furthermore, this drop will operate every time, and successfully, through from 15,000 to 25,000 ohms.*

This is the drop to purchase—it has proven its worth and demonstrated its superiority hundreds of times this year.

Write for Latest Prices and Literature

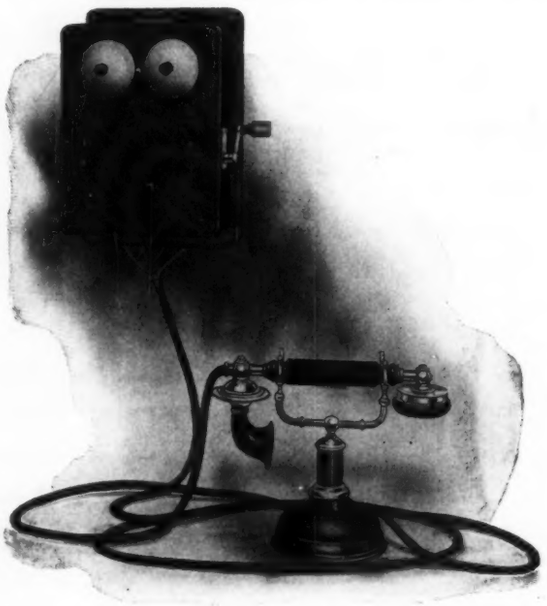
Stromberg-Carlson Telephone Mfg. Co.

Rochester, New York, U. S. A.

Chicago, Ill. **Toronto, Can.** **Kansas City, Mo.**
Los Angeles, Cal. **San Francisco, Cal.** **Seattle, Wash.**

Ericsson Magneto Desk Sets

For design, appearance, finish, workmanship, efficiency and durability, the name ***Ericsson*** has always stood for the very first and best. It applies to Magneto Desk Sets as well as to all other types. Some of our customers have written us that they felt we "gave **too much** for the money."



No. 375 to 396

No. 401 to 424 Standard Type

Cradle Switch Handmicro Type

Standard equipment furnished as follows: No. 1 handmicro telephone, induction coil and lightning arrester. Stands either nickel plated or enameled.

The easiest way to prove it is to send for Catalog No. 91 and order a few from it. "There's no depreciation to an 'Ericsson.'"

ERICSSON MFG. CO.

1102 Military Road, BUFFALO, N. Y.

600 Preston Ave., Houston, Texas.
209 3rd Ave. N., Nashville, Tenn.
706 Paulsen Bldg., Spokane, Wash.
1111 Wyandotte St., Kansas City, Mo.
530 Golden Gate Ave., San Francisco, Cal.
214 So. Second St., Cedar Rapids, Iowa.
121 So. Pinckney Street, Madison, Wisconsin.
329 Ankeney Ave., Portland, Ore.
22 N. 6th St., Minneapolis, Minn.
53 East Broadway, Butte, Montana.
136 So. 10th St., Lincoln, Neb.
517 W. Main St., Louisville, Ky.
1233 So. Olive St., Los Angeles, California.
121 So. Meridian St., Indianapolis, Indiana.
453 Atlantic Ave., Boston, Mass.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Two Exceptional Telephone Bargains

This is a successful ***Clean-up Telephone Sale*** offering every Independent telephone company exceptional bargains in Standard Local Battery equipments. Several hundred telephones have been sold this month. If you have not ordered before, do so now while we are offering a ***10 per cent discount additional.*** The equipments assembled in these popular types of well made golden oak and walnut woodwork are neither ***remade*** or ***rebuilt*** stocks. Every telephone is guaranteed—we are not trying to sell you anything that would in any way reflect disfavorably upon our reputation as ***quality apparatus manufacturers.*** Be advised—order as many of these telephones as you can use in the future—***and order them today.***

$9.50 less ten per cent

Golden Oak or Walnut Narrow Battery Box Type Series and Bridging

$9.50 less ten per cent

At the following special prices we furnish our No. 7-B Transmitter, No. 22 Triplet, No. 3-A Receiver and No. 6 Type Non-Sticking Ringer, including two cells of Columbia Dry Batteries.

Series — 3 or 4 Bar Generator 100 ohm Ringer- - - - **$7.00 Ea.**

Bridging — 4 Bar Generator 1000-1600-2000 ohm Ringer - **$9.00 Ea.**

Bridging — 5 Bar Generator 1000-1600-2000 ohm Ringer - **$9.50 Ea.**

Special Prices are F. O. B. Rochester, Chicago, Kansas City

Golden Oak or Walnut Wide Battery Box Type Series and Bridging

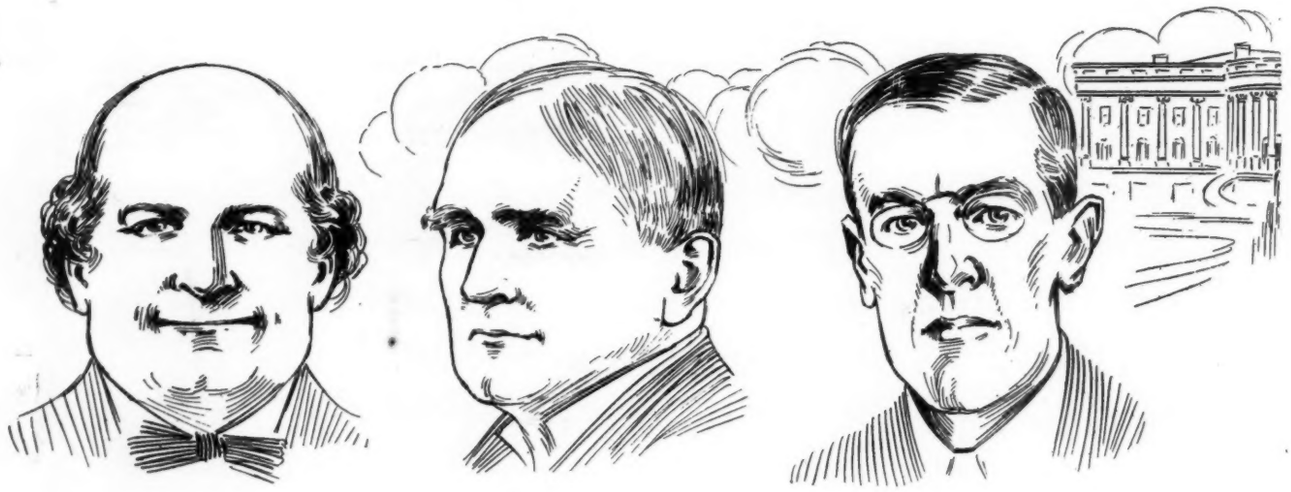
Tell Us When and How Many Today

Stromberg-Carlson Telephone Mfg. Co.

Rochester, N. Y., U. S. A.

Chicago, Ill. **Toronto, Can.** **Kansas City, Mo.**
Los Angeles, Cal. **San Francisco, Cal.** **Seattle, Wash.**

Please tell the Advertiser you saw his Announcement in TELEPHONY.



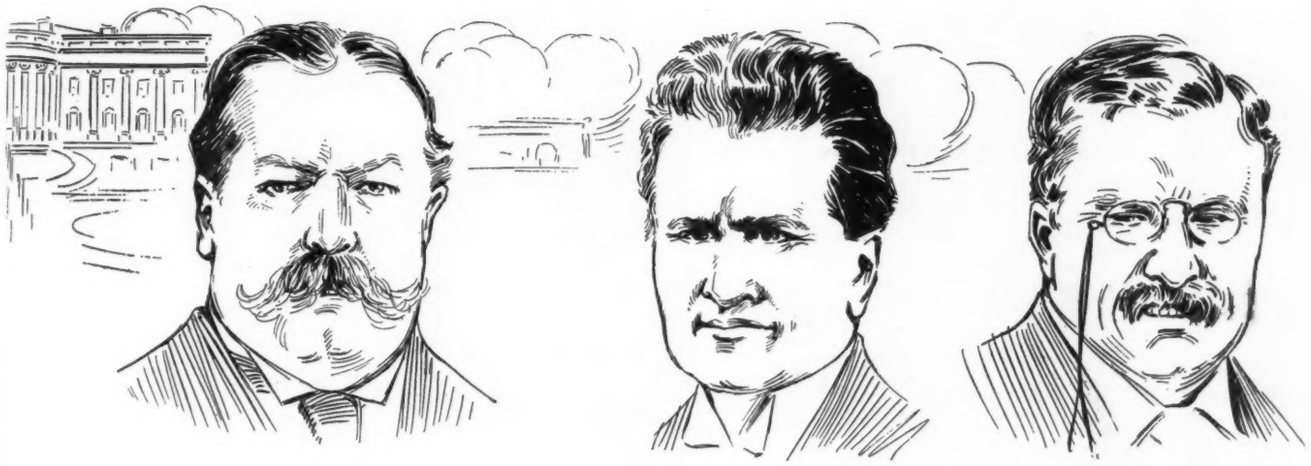
The Most Popular Candidate

A Real Progressive

KELLOGG SWITCHBOARD

FACTORY AND GENERAL OFFICE: CHICAGO, ILL.

Please tell the Advertiser you saw his Announcement in TELEPHONY.



In the Independent Field

The RECORD of the Kellogg Desk Stand, which has SERVED and is serving in all parts of the country under mild and extreme climatic conditions, is beyond reproach. It is HEARTILY ENDORSED by all. No instrument IN THE FIELD is capable of standing the ABUSE and rough handling as the Kellogg Unbreakable, and this because it is HONEST in its construction—every part is of the best quality material.

All metal parts are made from punchings of sheet brass which not only give greater strength but add greatly to the beauty of the instrument. The head and transmitter lug are made of heavy sheet brass drawn into the desired shape making it practically unbreakable. The transmitter back and lug are made in one piece which prevents the possibility of the transmitter working loose from the lug. You will find no screw heads, nuts, or other projecting parts to catch the clothing.

The polished hard rubber covering over the handle—on the tubular standard—does away with the unsightly wear or tarnish found in so many instruments with the nickel plated standard. This instrument impresses you immediately with its unusually handsome appearance—pick it up and use it and the distinct transmission and speedy operation it gives will convince you of its absolute superiority.

It is a TRIED AND FOUND TRUE piece of apparatus, and has the BACKING of the strongest INDEPENDENT manufacturer, and has for its "PLATFORM," "The service of the telephone proves the worth of the line." Write for information on the "Kellogg Unbreakable."

AND SUPPLY COMPANY

BRANCH HOUSES: KANSAS CITY, MO., SAN FRANCISCO, CAL.

AN INCREASED RATE FOR AUTOMAPHONE SERVICE IS WILLINGLY PAID BY SOME OF THE SUBSCRIBERS —IN EVERY MAGNETO EXCHANGE.

The Switchboard drop can be operated automatically by removing the receiver from the switch hook of the Automaphone, giving your subscriber the same service rendered by the use of common battery equipment. The practicability of the Automaphone has been clearly demonstrated by thousands of these instruments placed in service during the past two years.

WE NOW OFFER TO THE TRADE OUR NEW AND IMPROVED DESK AUTOMAPHONE, GUARANTEED TO GIVE SATISFACTION WHEN PLACED IN SERVICE UNDER MODERN OPERATING CONDITIONS.

We recommend the Automaphone in place of Common Battery Equipment for exchanges operating up to a thousand telephones.

The complicated cord circuits for connecting Common Battery telephones to Magneto or farm line telephones are eliminated and the circuits of the Magneto Switchboard and Automaphone are readily understood by the average telephone man.

The operation of the telephone by the subscriber is identical with that of a Common Battery System. The first cost of Switchboard equipment is considerably less.

Write us for our No. 3 Bulletin and Prices.

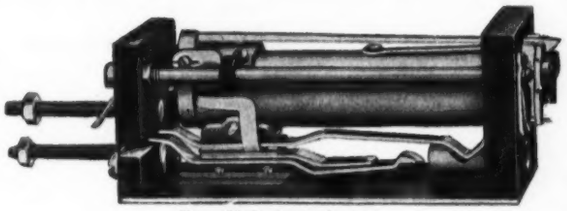
Cracraft, Leich Electric Co.

GENOA, ILLINOIS, U. S. A.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

All Stantard Makes of Unit Type

Drop and Jacks

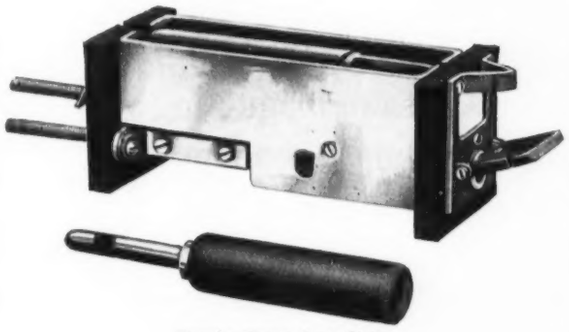


Swedish-American

¶ Big stock and immediate shipment of standard Swedish-American latest type drops and jacks, plugs, etc. We have also designed a later and better drop using same principle as the Burns Express but made to fit the Swedish-American board.

¶ The simplest and best form of construction is the unit type, and the Burns Express is the popular standard. Fewer parts, quicker to operate, longer life. Hundreds of boards in successful operation.

FIRST, LAST AND ALWAYS
AMERICAN
FOR SERVICE and SUCCESS



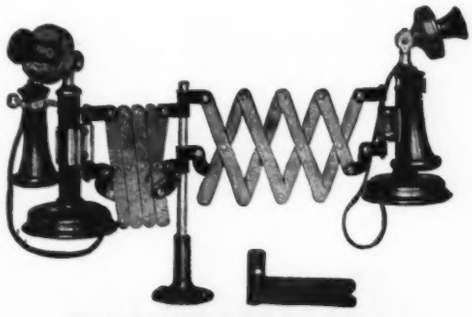
Burns Type Swedish

ASK FOR PRICES

Burns Express Number 45

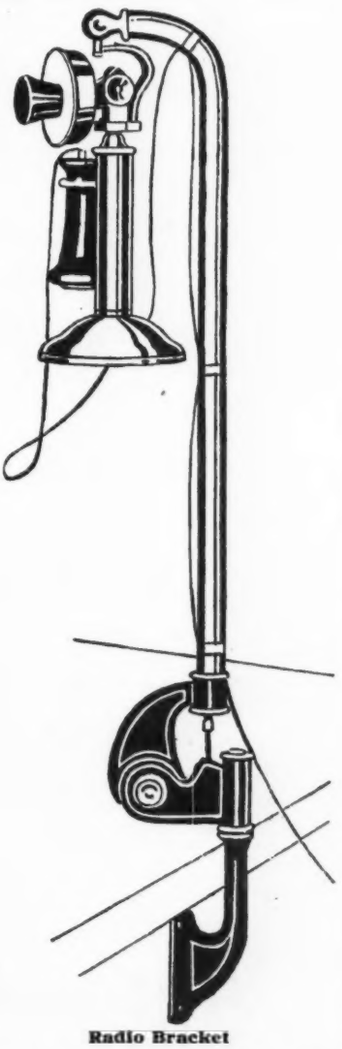
¶ We have taken over all the rights to the "Radio" adjustable telephone arm already well known and will continue to make this popular article but selling at a lower price of $4.50 each.

¶ The Burns bracket is still the accepted standard for this work and there has been more sold of this bracket than any other made. It has recently been improved in several respects.



Burns Bracket--Double or Single

SEND IN ORDERS NOW



Radio Bracket

AMERICAN ELECTRIC COMPANY

State and 64th Sts. (Englewood Sta.) CHICAGO, ILL.

Let Us Furnish You with Operators

¶ Most telephone managers realize the difficulty of securing, educating, disciplining and retaining operators.

¶ Recently enacted legislations providing for shorter hours, together with public discussions agitating higher pay for female workers is having a tendency to *increase operators' salaries* to a prohibitive scale.

¶ In addition to this the public is constantly demanding *better service* and lower rates.

¶ The result is that the telephone manager constantly has a fight on his hands—first with the operators demanding higher salaries—then with the public demanding lower rates and better service.

¶ Why not eliminate this constant strife?

¶ *Why not employ automatic operators!*

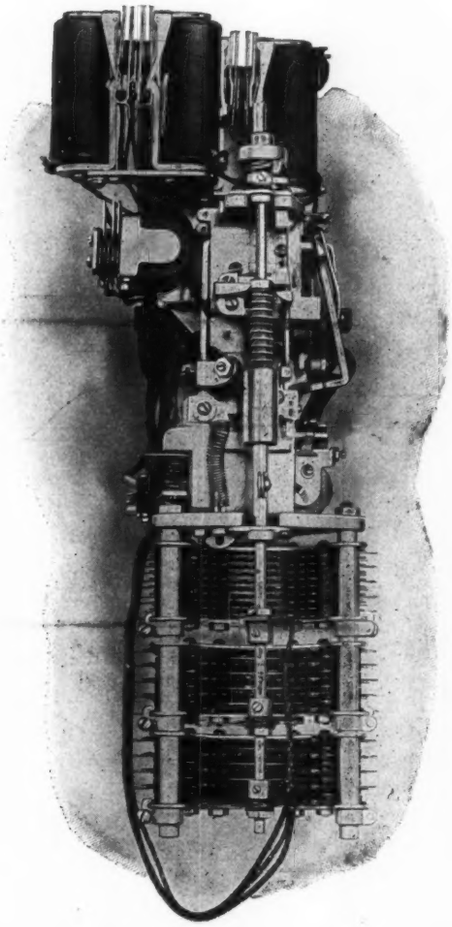
¶ Our automatic telephone system eliminates all of your human operator troubles—is approved by the public—and renders perfect service at the lowest cost.

Automatic Electric Company
Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

The Automatic Operator

She Neither Sleeps Nor Eats



She Is On the Job 24 Hours of the Day

"LIZZIE"

She performs her duty without a murmur—demands no pay—and does not antagonize the subscriber.

Automatic Electric Company
Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

PITTSBURGH REINFORCING POLE COMPANY

(THE ORR REINFORCEMENT-PATENTED)

435 SIXTH AVENUE

W. A. McCOMBS
SALES MANAGER

PITTSBURGH, PA. May 28, 1912.

Mr. W. H. Graffis,

Telephony Publishing Company,

Chicago, Illinois.

Dear Sir:

We began this year's advertising last February, and at the time of placing it I did not figure on many direct returns, but rather the general publicity we would get. We are very much surprised to find that up to the present time, the profits on the direct business we have secured as a result of our advertising in Telephony have exceeded our appropriation for the year.

This leaves no doubt in our mind as tothe value of your paper.

Yours sincerely,

W. A. McCombs

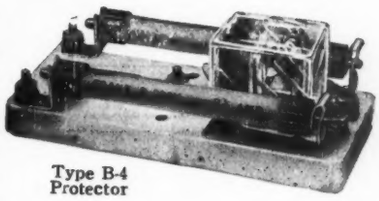
Sales Manager.

COOK

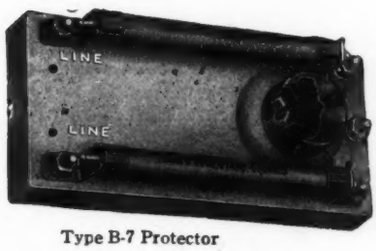
You Can Rely On Cook Protectors

TERMINALS PROTECTORS

Type B-4 Protector is carefully designed to render the most effective, inexpensive service. Equipped with Cook non-arcing and flashing tubular fuses. A celluloid dielectric of uniform minute perforations is provided with the improved carbon lightning arresters. Particles of carbon are prevented from breaking off and short circuiting, as the perforations promptly break up any discharge, forcing it through the arrester at many points.



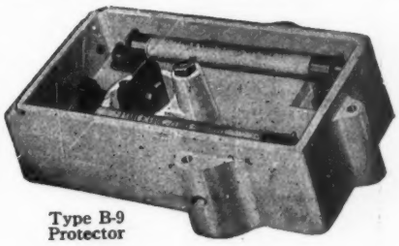
Type B-4 Protector



Type B-7 Protector

Type B-7 Protector is especially designed for indoor use. The graceful lines of construction are prevalent in this unique protector as in the other Cook specialties. Equipped with Cook's new tubular fuses and carbon lightning arresters. Carbons in the arrester set into the porcelain base and are covered by a brass perforated cap to allow for the expansion of heated air. The porcelain in this protector is much larger and heavier and less liable to breakage in handling and shipping.

Type B-9 Protector is designed for either interior or exterior use and is entirely weatherproof. It is of box form, the body being a heavy porcelain casting, equipped with a cover securely held by a strong brass bolt. The Cook Tubular fuses are embodied in this style in addition to the carbon lightning arresters. All parts carefully finished.



Type B-9 Protector

COOK PROTECTORS WILL SAVE YOUR APPARATUS AT THE LEAST EXPENSE TO YOU. GIVE THEM A TRIAL.

Frank B. Cook.

326 West Madison Street
Chicago

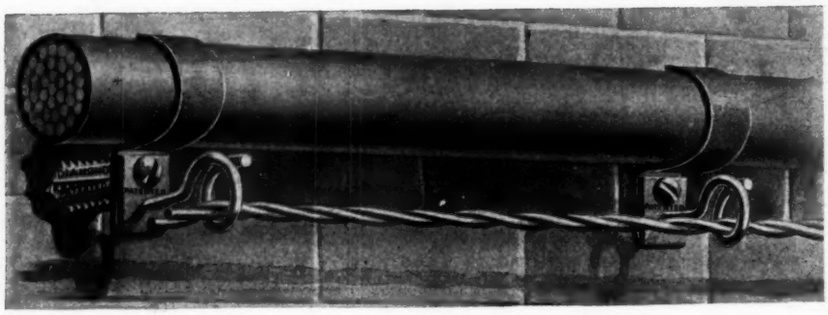
Western Representative:
Manny-Meyers Co., Seattle, Wash.

Southwestern Representative:
Tel-Electric Co.,
Houston, Texas

CHICAGO

DIAMOND SPECIALTIES

"LONG SAUT" CABLE CLAMPS (Patented)



For securely fastening lead covered cables and bridle wires with one attachment to exterior or interior walls of buildings.

DIAMOND EXPANSION BOLTS

DIAMOND

SCREW ANCHORS

For Securely Fastening Telephone Equipment to Brick Stone and Concrete Walls

"DIAMOND N" 4 POINT DRILL

"DIAMOND N" DRILL HOLDER AND POINTS

Diamond Expansion Bolt Co.

Manufacturers of DIAMOND SPECIALTIES
90 West Street, Corner Cedar NEW YORK

"SAVE TIME AND FREIGHT"

Western Electric Company

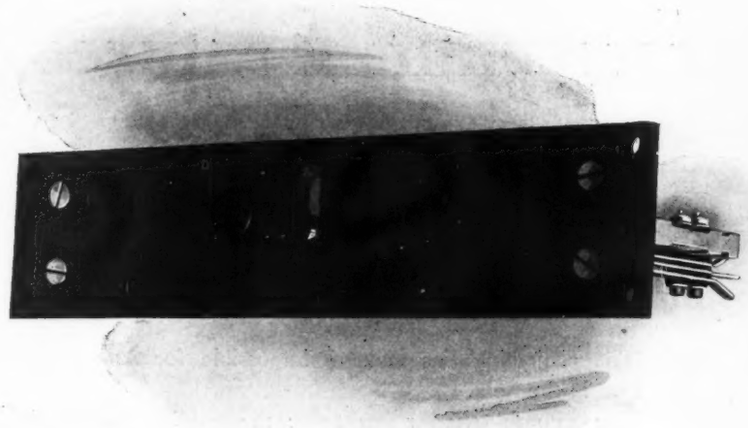
New York, Chicago, Omaha, Dallas,
Buffalo, Milwaukee, Kansas City, Los Angeles,
Philadelphia, Minneapolis, Oklahoma City, San Francisco,
Boston, St. Paul, Salt Lake City, Oakland,
Richmond, St. Louis, Denver, Seattle,
Atlanta, Detroit, Portland.

Also Houses in All Principal Foreign Cities

Address the house nearest you.

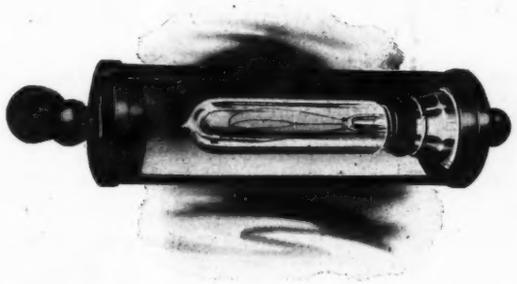
"SAVE TIME AND FREIGHT"

"TELEPHONE OUR NEAREST HOUSE" EQUIPMENT FOR EVERY ELECTRICAL NEED "TELEPHONE OUR NEAREST HOUSE"



Switching Toll Lines at Night

¶ In a great many exchanges a toll operator is not needed at night, and it effects an economy to switch the toll lines from the toll board to the local board during the night. The key here illustrated is made for this particular purpose. It has but one cam handle which controls the operation of ten sets of springs, so that ten toll lines may be switched from a toll board to a local board with a single movement. The parts used in making this ten-line switching key are identical to the parts used in all Monarch switchboard keys. The price is reasonable.



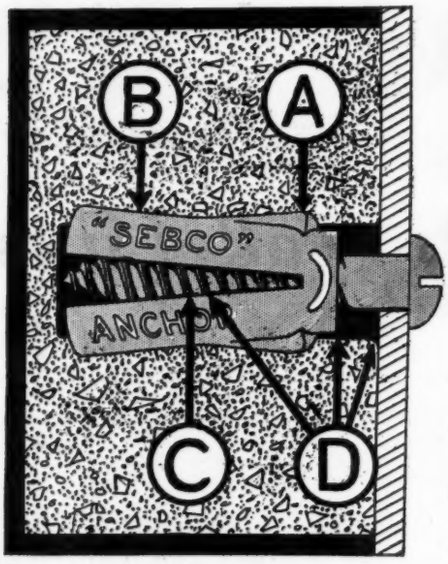
Lighting the Switchboard

¶ A satisfactory lighting fixture for switchboards of any size is illustrated above. It can be mounted on any cabinet, and as the reflector is adjustable, the light may be thrown at any desired angle. The illustration shows the lamp exposed to view, but the reflector shield being loose between the two end mountings can be turned so that the opening will be downward, thus casting the light over the front of the board while the lamp is out of sight of the operator. This fixture is made in two sizes, one for a single lamp like the illustration, and the other arranged for two lamps.

Monarch Telephone Manufacturing Co.

General Office and Factory
Fort Dodge, Iowa

Southwestern Branch - - - Dallas, Texas



Important Features of the SEBCO Screw Anchor

Illustrating Many Points of Superiority

(a) The projecting fins make it impossible for Anchor to turn in the hole.

(b) The smooth exterior has twice the holding power of Anchors covered with projections.

(c) The screw by cutting its own thread becomes part of the Anchor and cannot be loosened by strain or vibration.

(d) Should the hole be drilled too deep, the Sebco Anchor will still expand sufficient for a firm hold.

Made of non-rusting composition metal into which the screw cuts its own thread—can be inserted into a smaller hole than any other Anchor.

For Fastening Electrical Apparatus to Walls, Floors, Ceilings, etc.

Sebco Screw Anchors will take all Wood Screws, Machine Screws and Special Screws from No. 5 (being ⅛-inch diameter) to No. 30 (being ½-inch diameter). Several diameters of screws may be used in one size of Anchor.

No. 10 Size

A No. 6 Sebco Anchor will easily hold 150 pounds
A No. 10 will hold 250 pounds and
A No. 14 will hold 375 pounds.

Sebco Screw Anchors have been adopted as standard by the American Telephone and Telegraph Co. and its Licensees; also by practically every large independent telephone company throughout the country.

They are used for fastening electrical apparatus and telephone equipment of all kinds to brick, stone, concrete, tile and all such substances other than wood.

STAR-EXPANSION BOLT CO.

147-149 Cedar St., N. Y.

DISTRIBUTORS

"SAVE TIME AND FREIGHT" *Western Electric Company* "SAVE TIME AND FREIGHT"

New York, Buffalo, Philadelphia, Boston, Richmond, Atlanta, Savannah, Pittsburgh, Cincinnati, Indianapolis, Detroit, Chicago, Milwaukee, Minneapolis, St. Paul, St. Louis, Omaha, Kansas City, Oklahoma City, Salt Lake City, Denver, Dallas, Los Angeles, San Francisco, Oakland, Seattle, Portland.

Also Houses in All Principal Foreign Cities

Address the house nearest you.

"TELEPHONE OUR NEAREST HOUSE" **EQUIPMENT FOR EVERY ELECTRICAL NEED** "TELEPHONE OUR NEAREST HOUSE"

WESTERN
CEDAR POLES
We treat our Poles and Cross Arms with Genuine Avenarius Carbolineum

DOUGLAS FIR
CROSS ARMS
Pioneers in Western Pole Industry
Producers and Mfrs.—Not Scalpers
THE LINDSLEY BROTHERS COMPANY, Spokane, Wash.

GOOD QUALITY
—
LARGE VARIETY

IDAHO RED CEDAR POLES
Sandpoint Lumber & Pole Co. Ltd.
SAND POINT, IDAHO

CORRECT PRICES
—
PROMPT SHIPMENTS

35c per gallon for
Hy-Boil-Oil
a high grade carbolineum
German Importing Co., Chicago

IDAHO AND NORTHERN
CEDAR POLES
WE ARE PRODUCERS
Yards in IDAHO, MICHIGAN, CANADA.
Toledo Yard for Urgent Orders. : : Get our Prices.
Ask for Leaflet No. Six
THE F. BISSELL COMPANY, TOLEDO, OHIO

POLES OF
STERLING QUALITY
Oldest Cedar Pole Firm in Business
MICHIGAN WHITE CEDAR
W. C. STERLING & SON COMPANY
1880 MONROE, MICHIGAN 1912

White Cedar Poles
C. H. WORCESTER CO.
CHICAGO

CEDAR POLES
We have a fine lot of poles, especially 4" 20'.
Our poles are strong and tough—the kind you need for long service.
LET US SEND QUOTATIONS TODAY
PERLEY LOWE & COMPANY
1605 Railway Exchange Building, CHICAGO

The National Pole Company
Is the Greatest Producer of
Cedar Poles
In the World

Profit by their exceptional facilities and get your poles quickly and at a fair price.

Carefully selected Cedar Poles from the stump to the line.

Write for Quotations

The National Pole Co.
Escanaba, Mich.

NATIONAL
POLE COMPANY
ESCANABA, MICH.
CEDAR
POLES

Please tell the Advertiser you saw his Announcement in TELEPHONY.

CEDAR

NORTHERN POLES WESTERN

We are pioneers in the butt-treatment of poles using Chemical Wood Preserver. Write us.

THE VALENTINE-CLARK COMPANY
MINNEAPOLIS, MINN.

Western Sales Office: St. Maries, Idaho

Leading Companies use Page & Hill Co.'s

BUTT-TREATED POLES

The companies who use our Butt-Treated Poles are among the most progressive and most influential in the country. This is good evidence of the efficiency of our treatment.

Page & Hill Co.

Lumber Exchange Minneapolis

"NAUGLE"

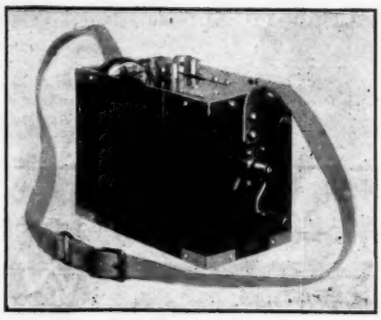
THAT ONE WORD SAYS MORE THAN A PAGE OF TALK

It stands for the Trinity in Poles
"SERVICE"—"PRICE"—"QUALITY"

NAUGLE POLE & TIE CO.

Main Office: 5 South Wabash Ave., Chicago.

This Lineman's Test Set Tells



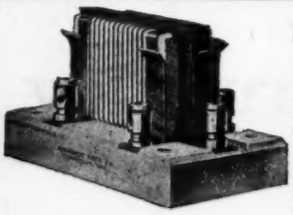
you which way the trouble lies from you without cutting a wire—no matter where you are on the line.

Saves livery, shortens trouble period and makes an expert of your lineman.

Now used with much success by both large and small companies.

Write for literature and prices.

STEWART BROTHERS Ottawa, Ill.



THE 400 COMPANION ARRESTER

Simple in construction. Once installed you are not troubled with renewals. Very dependable—ideal for toll line and rural service. No grounds or short circuits from carbon particles thrown off.

Chance Mfg. Co., Centralia, Mo.

MORSE TREE INSULATORS

Clear Annoying Grounds

Substantial Number of Orders Filled this Month

One manager writes: "Our maintenance department has been able to clear some very annoying grounds which could not have been cleared otherwise."

Why not try them out?

100 f. o. b. cars Cleveland for $4.00

The Electric Appraisal & Inspection Co.
Electric Bldg., Cleveland, O.

Door Open

The "French" Folding Door Telephone Booth

(Patent Pending)

ABSENCE OF LATCHES OR CATCHES: The design of the "Folding Door" is such that it will remain open or closed without the use of latches or catches. This is one of the many advantages of the "Folding Door" telephone booth.

THE "FRENCH" FOLDING DOOR
means
ECONOMY of SPACE—PERFECT VENTILATION—SILENCE in OPERATION

Write for booklet describing the advantages of the "Folding Door" Booth.

C. B. FRENCH CABINET COMPANY, Inc.
46-48 Fulton St. BROOKLYN, N. Y.

Door Closed

Please tell the Advertiser you saw his Announcement in TELEPHONY.

WHITE CEDAR POLES

We handle just the poles for your purposes—the kind that you can depend upon to give service.

We are producers of poles—not jobbers. Consequently reasonable prices.

Let us quote you on your next order.

KAYE & CARTER, 1043 Lumber Exchange Bldg., Minneapolis, Minn.

CEDAR POLES Prompt Shipments. Write for Prices.

Torrey Cedar Co., Clintonville, Wis.

They last longer in any soil—Stand twice the breaking strain of others.

CHESTNUT POLES LARGE STOCKS LOW PRICES QUICK SHIPMENTS

Write to-day to PADUCAH POLE & TIMBER CO., Paducah, Kentucky

IDAHO CEDAR POLES

This particular kind always gives satisfaction. Never known to fail. Get our prices. PEND OREILLE CO., Clarks Fork, Idaho

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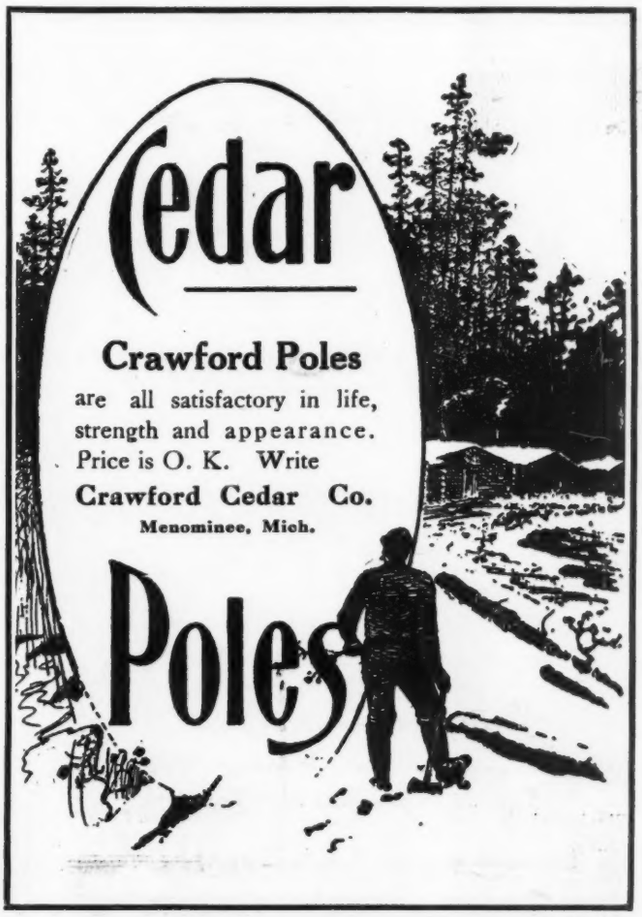
Oldest in the business.

POLES and **CROSS ARMS**

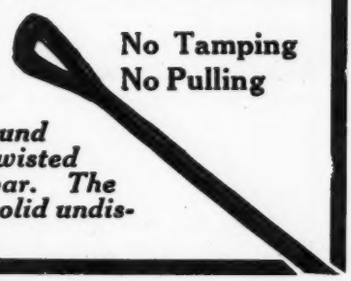
Prompt Shipments
Lowest Prices—Write

WM. MUELLER & Co. 920 Postal Teleg. Bldg.
Established 1862 CHICAGO



D & T Drive Twist Anchors

No Digging
No Screwing
No Tamping
No Pulling



Driven into the ground with a sledge. Twisted three turns with a bar. The blades open under solid undisturbed earth.

Accessible, Quiet, Elegant
For Business Men, Families and Tourists

THE
SOUTHERN HOTEL
54th Street near Broadway, NEW YORK
FIREPROOF MODERN
PERMANENT & TRANSIENT

In the Heart of the theatre and shopping district.
Cars pass the door for all railroad stations.
Parlor, Bedroom and Bath, $3.50, $4.00, per day and up.
Single Room and Bath, $1.50, $2.00 per day and up.
Double Room and Bath, $2.50, $3.00 per day and up.
SPECIAL RATES BY THE WEEK
RESTAURANT a'la CARTE
J. G. VENETOS, Proprietor **EUROPEAN PLAN** *Send for Booklet*

HYDE'S
TELEPHONE TROUBLES
and
HOW TO FIND THEM

An up-to-date manual pertaining to Telephone Troubles and their remedies on both magneto and Common Battery Systems—also containes table of ***Cost Units*** for estimate work. The use of all technical terms has been avoided. No telephone man can well afford to be without this handy book—it costs but 25c.

For sale by
TELEPHONY PUBLISHING CO.
MONADNOCK BLOCK — CHICAGO

SPECIAL TRIAL OFFER

We will send a trial order of 12 anchors, freight prepaid, to any telephone company in the United States, with the distinct understanding that you may install them on your own lines and give them any test you wish. If you do not find them better than any other anchor you have ever seen or used, and cost you far less installed, we want you to ship them back at our expense.

D & T Anchors installed cost less than any other anchor

MADE IN THREE SIZES

No. 1. For light guy work, each, $1.00
No. 2. For medium guy work, each, $1.25
No. 3. For heavy guy work, each, $1.50

The Vote-Berger Company
88 Railroad St., LaCrosse, Wis

Gentlemen: Please send me the following Anchors, freight prepaid, on the above trial offer.

.... No 1 D. & T Anchors
.... No 2 D. & T Anchors
.... No 3 D. & T Anchors

Name.....
Town.....
Name of Company.....

Underground

CONDUIT SYSTEMS

our specialty

WORK STARTED

AT ANY POINT

WITHIN 48 HOURS

Write us for estimate

G. M. GEST

Engineer—Contractor

Executive Office

277 Broadway, New York

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Chicago
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It Pays to Protect Your

CABLE

Lead cable sheath not only is expensive but very easily damaged unless properly safeguarded.
It is especially liable to injury where it passes through trees or over railroads and it is in such cases that the absolute, inexpensive protection afforded by Aerial Conduit more than pays for itself each year.
Write today for booklet describing the way in which Aerial Conduit prevents deterioration of cable sheath.

Aerial Conduit Co.

Nelson G. Hunter, Pres.

Wabash, - - - Indiana

EVERY TELEPHONE BUILDER NEEDS THIS NEW BOOK

It is the plainest, most practical and most helpful telephone work ever published. . . . Price $4, postage prepaid.

Hall's Hand Book of

STANDARD TELEPHONE CONSTRUCTION METHODS

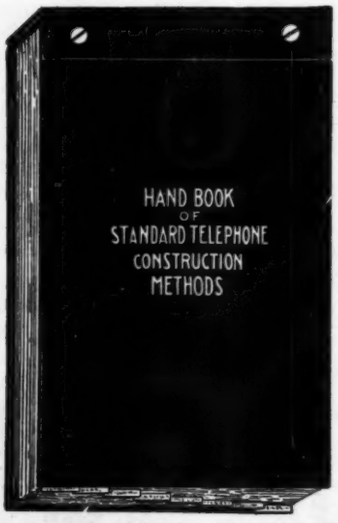
By

FRANK B. HALL

280 Pages of Specifications.

250 Pages of Illustrations.

Pocket Size, Loose Leaf, Bound in Black Leather. Price $4.00; Postage prepaid.



CONTENTS OF HALL'S HAND BOOK OF STANDARD TELEPHONE CONSTRUCTION METHODS

SPECIFICATIONS EXCHANGE AERIAL CONSTRUCTION, Class "A," "B" and "C" Standard Pole Lines, 22 Sections.

SPECIFICATIONS EXCHANGE UNDERGROUND CONSTRUCTION—12 Sections.

SPECIFICATIONS TOLL LINE CONSTRUCTION—Class "D" and "E" Standard Pole Lines, 12 Sections.

SPECIFICATIONS TOLL LINE CONSTRUCTION—Class "F" Standard Pole Line, 5 Sections.

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MATERIAL SPECIFICATIONS—6 Sections.

MATERIAL CATALOG—25 Pages.

MATERIAL DRAWINGS—39 Pages.

FULL PAGE FIGURES SHOWING STANDARD METHODS—214 Pages.

This Entire Work—Non-Technical and Easily Understood

It is profusely illustrated with actual working plans and diagrams accompanying almost every page of text. It is printed on a good, tough quality of bond paper, pocket size, with binding that will stand hard usage in the field. It is loose-leaf so that one can add to or change pages of drawings or specifications as standards change; or add typewritten tables or other data and thus always have information of the same character properly grouped under one cover.

NOW—*While you have building problems to solve—*
TODAY—*is when you need this book most*
Is the time to order. . . . Tomorrow you may have perpetrated some costly blunder which this manual would have helped you to avoid. . . Send money order, currency, or check for $4 to

TELEPHONY PUBLISHING CO., CHICAGO 344-347 MONADNOCK BLOCK

Patent Pending

"Hy-Po-Stat"

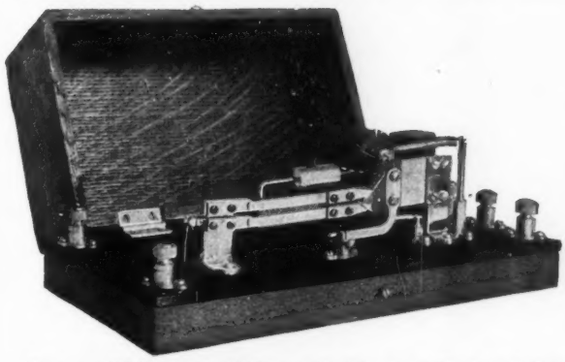
The All Metal and Porcelain Cable Protection.
This is the terminal that

"Protects Your Cables"

and makes your investment a permanent one.
For further information ask your jobber, or write

The Royal Electric Company
SIDNEY, OHIO

Pole Changers For All Requirements



If you are thinking of installing a pole changer, write to us before buying. Our pole changers will meet your requirements. They give ringing service which is second to none and require less attention than other makes.

We will send it to you on thirty days trial and if it does not prove to be satisfactory you may return it at our expense.

Our Simplex pole changers for A. C. and Pulsating current at $15.00 or for both at $17.00. Let us know what you will need.

The following is a sample of the many letters we have received from our customers after they have used one of our pole changers for thirty days.

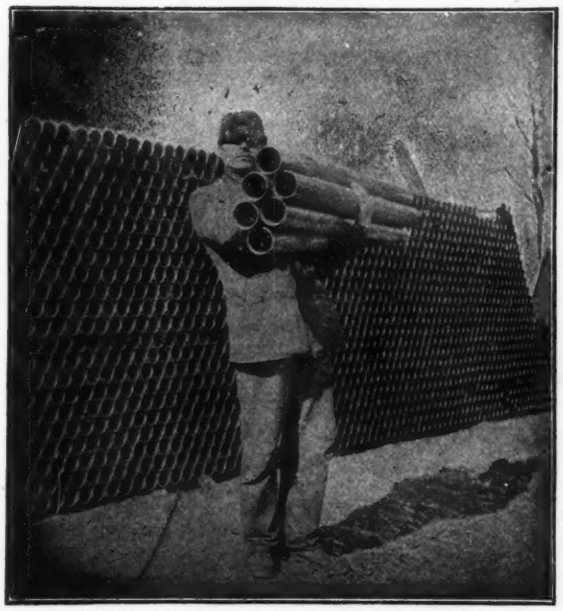
Homer Roberts Mfg. Co., Chicago, Ill. *N. C., Oct. 2, '11.*

Gentlemen:

I enclose you check for $15.00 for one Simplex pole changer, which has proven very satisfactory. Thanking you for same, I am,

Very truly,

Homer Roberts Mfg. Co.
659 Melrose St. .:. Chicago, Ill.



Carrying 30 feet 3-inch socket joint conduit.

Orangeburg Fibre Conduit

("Admitted to be the best Fibre Conduit")

Made in FOUR STYLES OF JOINTS

Socket, Sleeve, Screw and Harrington

WITH BENDS AND FITTINGS FOR SAME

Is the lightest conduit made

and means low freight and cartage costs

Send for The Conduit Book

THE FIBRE CONDUIT COMPANY

103 Park Ave., New York
1741 Monadnock Bldg., Chicago
S. B. Condit, Jr., & Co., Boston, Mass.
Bryant Zinc Co., Chicago, Ill.

MAIN OFFICE AND FACTORY
Orangeburg, New York
McClary-Jemison Machinery Co., Birmingham, Ala.
Tri-Provincial Electrical Supply Co., Winnepeg, Can.

Pierson, Roeding & Co.,
San Francisco, Cal.
Los Angeles, Cal.
Seattle, Wash.
Salt Lake City, Utah.

"Gets at the fire quickly"
(Girl is Holding the No. 1 Model.)

The Carbonic Fire Extinguisher Leaves NO DAMAGE in Its Wake

Water is ruinous to a switchboard and to cables, wiring, etc.

Chemical fire extinguishers are even worse because they leave a mess of corrosive sulphuric acid and bicarbonate of soda in their wake.

Sand tubes are slow, and the job of cleaning out the sand is not easy.

Wool blankets cannot be depended upon after the fire has a real start.

The Diamond Liquid Carbonic Fire Extinguisher is the New and Better Way

It puts out the fire ***instantly*** by a powerful jet of ice cold "soda water gas" that penetrates to places where sand cannot reach. This gas chokes the fire to death by cutting off its supply of oxygen.

And when the fire is out, the gas has left no trace of itself, because it is dry, invisible, odorless.

The tank is filled with liquefied carbonic gas, the gas used in charging soda or mineral water.

Point the nozzle at the seat of trouble, turn the wheel at the top, and the liquid carbon dioxide expands into gas escaping with great force from the nozzle.

No. 2—28" high. 6 lbs. of gas.

Address Nearest Branch for Booklet

BUILT BY
"The Liquid" Carbonic Company
JACOB BAUR, Pres. and Treas.
CHICAGO New York Boston
Pittsburg Cincinnati Milwaukee Minneapolis
Atlanta St. Louis Kansas City Dallas San Francisco

No. 1, 20½ inches high, round bottom. Holds 4 lbs. of Liquid Carbonic Gas. Complete with hose and couplings. F. O. B. Liquid Branches..... $12.50

No. 2, 28 inches high, flat bottom. Holds 6 lbs. of Liquid Carbonic Gas. Complete, with hose and couplings. F. O. B. Liquid Branches..... 15.00

Refills, at any of the Liquid Carbonic Co.'s branches

No. 1, each ..... .75
No. 2, each 1.00

Fires in Telephone Equipment

To reach the seemingly inaccessible fires in telephone equipment without danger to operator or equipment. This is the demand that the telephone man makes of fire extinguishers.

PYRENE FIRE EXTINGUISHERS meet this demand. When a telephone man realizes that there is an extinguisher that he can use on any part of his equipment at any time, *without injury or pause in service*, such an extinguisher becomes of prime importance and a necessary part of his plant.

PYRENE is a non-conductor of electricity.

PYRENE does not in any way affect varnished surfaces, insulation or mechanism, and is without moisture.

Drops, lamps, keys and relays will operate just as well submerged in PYRENE liquid as in dry air.

Write for our illustrated booklet.

Address Department D,

Pyrene Manufacturing Co.

1358 Broadway **New York City**

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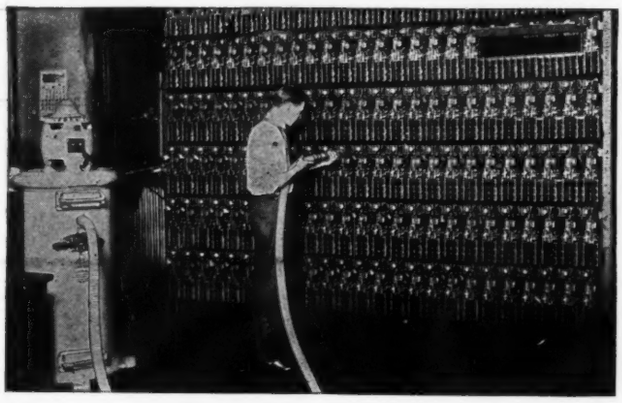

The Akron, Ohio, station, in which this photograph was taken, was so arranged that it was impossible to run the pipes through the floor. For this reason the TUEC Stationary Air Cleaning System was installed on the same floor with the switchboard.

Keep the Switchboard CLEAN

Don't allow the dust to accumulate until you get a short circuit.

Don't try to *blow* the dirt from between the complicated parts. To do this is merely to drive your troubles from one location to another and keep the repair man busy.

There is one right way to clean the switchboard, and only one,—the

TUEC STATIONARY Air Cleaning System

The TUEC sucks all the dust and dirt from the most inaccessible parts of the mechanism through a nozzle of soft rubber. This dirt is carried through pipes to an air-tight vessel in the basement while the dead air is vented into the open air. There is nothing difficult about cleaning the TUEC way,—no dirty hands, no filling the room with choking clouds of dust, no interference with the regular operation of the plant.

The same TUEC that cleans your switchboard will keep the entire building spotlessly clean and prevent the accumulation of dirt in the out-of-the-way places. Merely substitute the regular aluminum tools for the rubber nozzle and you can clean floors, walls, furniture and equipment and make the air in the exchange pure and fresh and wholesome, thereby increasing the comfort and the efficiency of your operators.

Write for booklet, estimates, etc.

The United Electric Co.
11 Hurford Street Canton, Ohio
TUEC Companies in all large cities

American Steel & Wire Company's
AMERICORE
RUBBER COVERED WIRE

A New Standard —A New Wire

EVERY COIL CERTIFIED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS

THE QUALITY of Americore Wire is such as to make it an absolute standard for interior wiring and to give the best possible fire protection.

Every foot is carefully inspected by us in the various stages of manufacture, and when completed is finally inspected by an authorized representative of the National Board of Fire Underwriters.

We are prepared to furnish this wire in all sizes of conductors, both solid and flexible, from warehouses conveniently located for quick delivery to all parts of the country.

SALES OFFICES

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NEW YORK, 30 Church St. DETROIT, Ford Building
WORCESTER, 94 Grove St. ST. LOUIS, 3rd National Bank Building
BOSTON, 120 Franklin St. DENVER, 1st National Bank Building
PITTSBURGH, Frick Bldg. ST. PAUL-MINNEAPOLIS, Pioneer Bldg., St. Paul
CINCINNATI, Union Trust Bldg. SALT LAKE CITY, Dooley Building

United States Steel Products Company

Export Department, New York, 30 Church St.
Pacific Coast Dep't, San Francisco, Rialto Bldg.
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Seattle, 4th Ave. South and Conn. St.
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Sterling **Quality**

Our Motto: Quality First—Prices Right

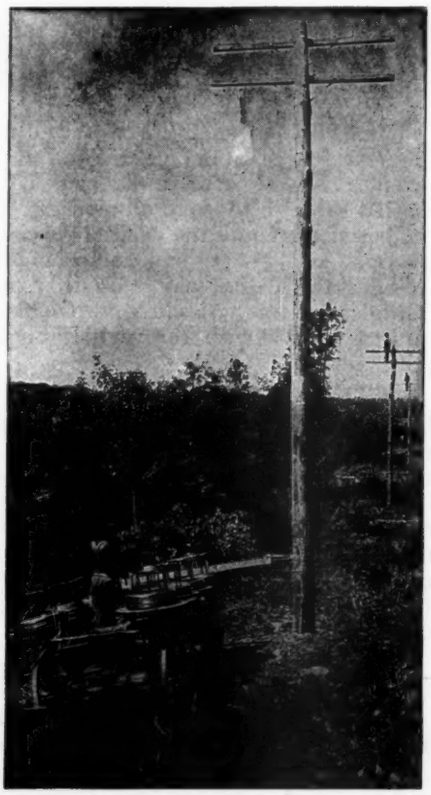
Distributing Frames
Can Top Terminals
Arresters and Protectors

Write for Bulletin No. 3 and Price List

Lafayette Electric & Manufacturing Co.
Lafayette, Indiana

Quality **Sterling**

SKILL and knowledge count in making telephone wire. Our experience and skill enables us to turn out a wire which if galvanization, tensile strength and conductivity are considered cannot be improved upon. Any claims we make for our wire are justified because of its service. Easily handled and strung. Samples with prices can be secured either of your jobber or of us.



Indiana Steel & Wire Co.
Muncie, Ind.

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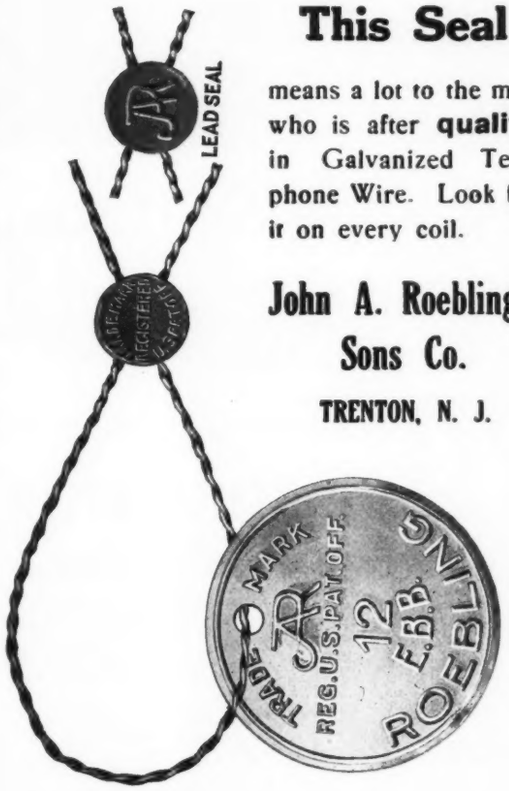


This Seal

means a lot to the man who is after **quality** in Galvanized Telephone Wire. Look for it on every coil.

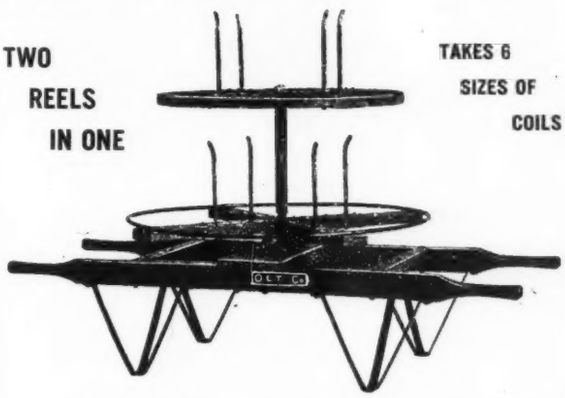
John A. Roebling's Sons Co.

TRENTON, N. J.

TRADE MARK **OSHKOSH** **TANDEM REEL**

TWO REELS IN ONE

TAKES 6 SIZES OF COILS



It pays out two wires at one time without interfering with each other. Costs little more than a single reel, but saves much time and trouble.

Oshkosh Mfg. Company

BOX 643

Oshkosh, Wisconsin

EVERSTICK ANCHORS

Have the greatest holding power. More "Eversticks" used than all other patented anchors. *There's a reason.* Write for literature.

Everstick Anchor Co.
ST. LOUIS, MO.

COMMONWEALTH HOTEL

INC.

Opposite State House,

BOSTON, MASS.

Offers rooms with hot and cold water for **$1.00** per day and up, which includes free use of public shower baths.

Nothing to Equal This in New England

Rooms with private baths for **$1.50** per day and up; suites of two rooms and bath for **$4.00** per day and up.

Dining Room and Cafe First Class. European Plan.

ABSOLUTELY FIREPROOF

Stone floors; nothing wood but the doors.
Equipped with its own Sanitary Vacuum Cleaning Plant.

Strictly a Temperance Hotel ***Send for Booklet***

STORER F. CRAFTS, General Manager

EVERYTHING IN POLE LINE HARDWARE

PEIRCE

Fire Alarm Fixture

used by many telephone companies for carrying fire alarm or signal wires. It is attached to top of telephone pole with through bolts or lag screws. Can be assembled to hold any number of wires from one to six. Constructed of best channel steel — usual Peirce resilient spring threads prevent insulator breakage.

There is a Peirce Bracket for every purpose. Write for descriptive Catalog.

Hubbard & Company
Pittsburgh
New York Chicago

A PEIRCE BRACKET FOR EVERY PURPOSE

Please tell the Advertiser you saw his Announcement in TELEPHONY.

PARANITE

The Standard for Telephone use

Rubber Covered Wires and Cables

Braided, leaded and armored cables; plain and braided copper and iron wires of any number of conductors *Manufactured by*

Indiana Rubber and Insulated Wire Company
JONESBORO, INDIANA

AMERICAN CROSS-ARM CO.

CHICAGO

BURNLEY

Soldering Paste
We are the pioneers---15 yrs. experience
Paste is free from acid---Can be used conveniently with safety Sample on request. Dept. T
Burnley Battery & Mfg. Co., North East, Pa.

Weston

A Complete Line of NEW ALTERNATING CURRENT SWITCHBOARD INDICATING INSTRUMENTS

is now offered comprising

WATTMETERS, Single and Polyphase, SYNCHROSCOPES, FREQUENCY METERS, POWER FACTOR METERS, VOLTMETERS, AMMETERS

THIS WHOLE GROUP OF INSTRUMENTS embodies the results of the most exhaustive study and scientific investigation of all the complex problems involved in the development of thoroughly durable, reliable and accurate instruments for use on alternating current circuits. Their production marks the culmination of an earnest effort to develop a line of alternating current switchboard instruments which would not only fully meet the numerous and exacting requirements of the art, as it exists to-day, but would also constitute a valuable and permanent contribution thereto. As such a contribution they are offered and we invite all who have not seen these new instruments to critically examine and compare them with other instruments intended for the same service.

Full particulars of design, construction, prices, etc., are given in Catalogue T. 16. Write for it.

Weston Electrical Instrument Co Newark, N.J.

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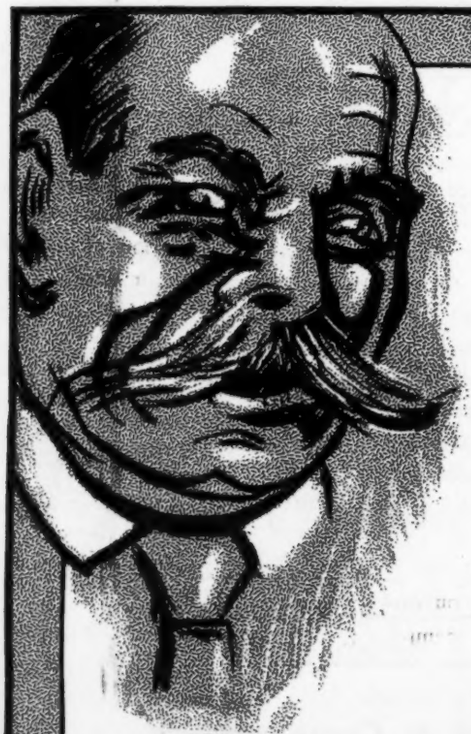
San Francisco, 682-684 Mission Street
London Branch—Audrey House, Ely Place, Holborn

Berlin—Weston Instrument Co., Ltd, Schoneberg, Genest Str. 5
Paris, France—F. H. Cadiot, 12 Rue St. Georges



Are You a "Show Me" Man?

If you're the type of man who won't use anything until merit is proven, you're the kind that when you do decide to use an article—it's right.

We believe in the same idea. If you use any other drop wire besides IRONITE—you are not getting the best in a drop wire. It's economy to use IRONITE.

Now, Mr. Show Me Man, listen! IRONITE will not break, sag or cause trouble calls. It is intended that IRONITE should give perfect satisfaction. *Users say it does.*

However we want to prove it to you if—you are a "Show Me" Man. We'll send you enough IRONITE for one long drop. Install it where you have the most trouble—test it out. If it doesn't give better results than your other drops we'll take back all we've said about it.

May we send samples?

IRONITE

If your jobber hasn't the genuine IRONITE with our tag and trade-mark—we'll fill your order gladly.

Paragon Sellers Company

162 N. Fifth Ave., Chicago, Ill.
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Los Angeles, 1229 Olive St.
Central Electric & School Supply Co., Toronto, Agent for Ontario

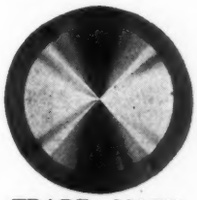
THREE FOR ONE

Copper Clad Tie Wires cost much less than copper ties but work as well on a copper line as would the copper ties.

Furnished dead soft annealed in 6, 8, 10, 12 & 14 B&S, in lengths from 12" to 22" at 10c a pound.

By using a Copper Clad Tie two gauges smaller than the conductor, which practice is recommended, the following results are shown:

1,000—14 B&S Copper Clad Ties 20" long cost.....$1.92
1,000—12 B&S Copper Ties " " " 6.31



TRADE MARK
"WELD-CLAD"

Duplex Metals Company

Main Office and Works: Chester, Pa.

Western Sales Office:
Peoples Gas Building, Chicago, Ill.

All Tests Are Interesting

But the one test that is convincing is putting the cells right on the job—using them for the actual work. It is the only way to determine which is ***the*** economical, efficient cell.

If you are not already a Red Seal user, make a test of this kind.

The guarantee protects you

The battery's quality protects us

Guarantee

We will *credit* account, *replace* batteries or *refund* amount paid for batteries including transportation charges if they do not prove satisfactory.

WRITE FOR NAMES OF NEAREST JOBBERS, PRICES, ETC.

Manhattan Electrical Supply Co.

Chicago	New York	St. Louis
114 So. Fifth Ave.	17 Park Pl.	1106 Pine St.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Samuel G. McMeen

McMeen & Miller

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Telephony Telegraphy Signaling Lighting Power

Plans Estimates Supervision Consultation Investigations Development of Inventions

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1454 Monadnock Block **CHICAGO**

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PATENT EXPERT
EXPERT
ELECTRICAL ENGINEER
CONSULTING ENGINEER
MONADNOCK BLOCK CHICAGO, ILLS.

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CHICAGO Harris Trust Bldg. **ENGINEERS** BOSTON 84 State Street

Plans, Specifications, Supervision of Construction
General Superintendence and Management
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Telephone and lighting plants designed and remodeled.
Reports on telephone and lighting properties.
Tests of street lighting systems.

TELEPHONE BUILDING PERTH AMBOY, N. J.

¶ That idea that works so well in your exchange may be converted into A Profitable Invention. Many years of experience enables us to judge.

¶We have fully equipped shops and laboratory; we perfect inventions, make models, secure patents.

H. R. Van Deventer, E. E. Solicitor of Patents SUMTER, S. C. R. M. Warren, M. E. Mechanical Expert

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Attorney and Counsellor at Law

1362 Monadnock Block - - - CHICAGO

GET HEMINGRAY GLASS INSULATORS

For Best Transmission

The teats on the petticoat, an exclusive feature of Hemingray Insulators, prevent water running to pins and causing grounds.

Hemingray Insulators are all insulation and are unusually free from breakage.

Write for Prices

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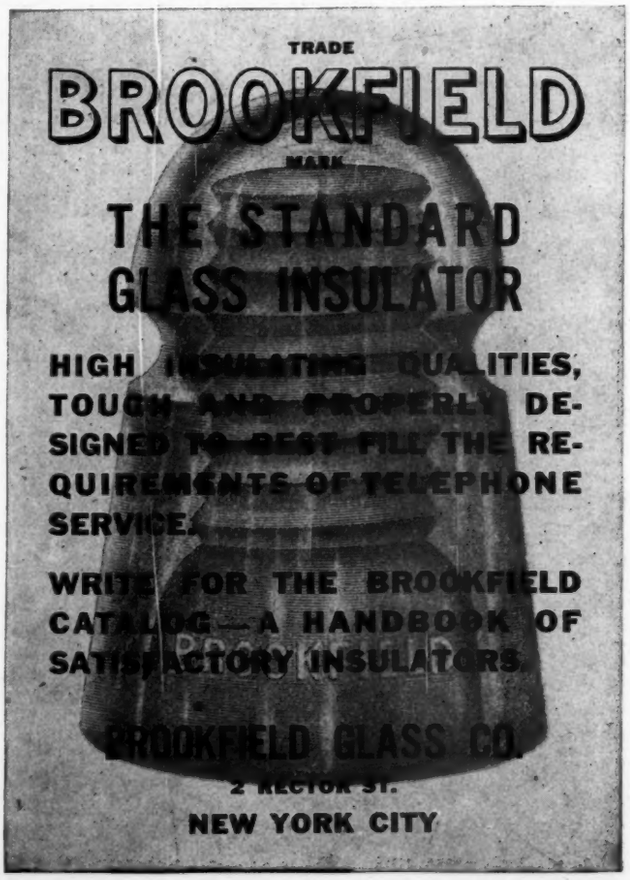
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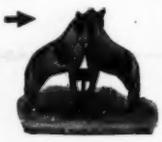

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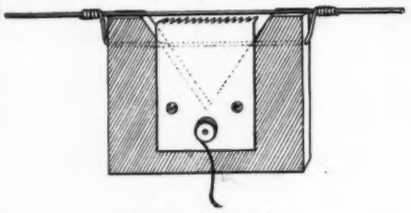

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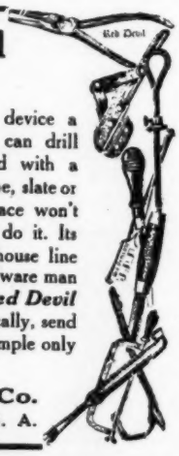

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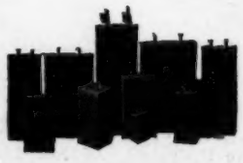

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